

# DIFLUOROPHOSPHORIC ACID

DFA

CAUTIONARY RESPONSE INFORMATION			
Common Synonyms Difluorophosphorous acid	Liquid	Colorless	Sharp, irritating odor
Reacts violently with water. Irritating gas is produced on contact with water.			
<b>Evacuate.</b> <b>KEEP PEOPLE AWAY.</b> <b>AVOID CONTACT WITH LIQUID AND VAPOR.</b> <b>Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).</b> <b>Notify local health and pollution control agencies.</b> <b>Protect water intakes.</b>			
<b>Fire</b>	Not flammable. POISONOUS GASES MAY BE PRODUCED WHEN HEATED.		
<b>Exposure</b>	Call for medical aid.  <b>VAPOR</b> Irritating to eyes, nose and throat. Move victim to fresh air. If in eyes, hold eyelids open and flush with plenty of water. If breathing is difficult, give oxygen.  <b>LIQUID</b> Will burn skin and eyes. Harmful if swallowed. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. DO NOT INDUCE VOMITING.		
<b>Water Pollution</b>	Effect of low concentrations on aquatic life is unknown. 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
Dilute and disperse Stop discharge Chemical and Physical Treatment: Neutralize Do not add water to undissolved material	2.1 CG Compatibility Group: Not listed. 2.2 Formula: HOPOF <sub>2</sub> 2.3 IMO/UN Designation: 8/1768 2.4 DOT ID No.: 1768 2.5 CAS Registry No.: Currently not available 2.6 NAERG Guide No.: 154 2.7 Standard Industrial Trade Classification: 52236
<b>3. HEALTH HAZARDS</b>	
3.1 Personal Protective Equipment: Air line mask or self-contained breathing apparatus; full protective clothing.	
3.2 Symptoms Following Exposure: Inhalation causes severe irritation of upper respiratory tract. Contact with liquid causes severe irritation of eyes and skin. Ingestion causes severe burns of mouth and stomach.	
3.3 Treatment of Exposure: Get medical attention as soon as possible following exposures to this compound. INHALATION: remove from exposure and support respiration. EYES: wash with copious volumes of water for at least 15 min. SKIN: wash with large amounts of water for 15 min. INGESTION: if victim is conscious, have him drink large amounts of water followed by milk or milk of magnesia.	
3.4 TLV-TWA: Not listed. 3.5 TLV-STEL: Not listed. 3.6 TLV-Ceiling: Not listed.	
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: Vapors cause moderate irritation such that personnel will find high concentrations unpleasant. The effect is temporary.	
3.11 Liquid or Solid Characteristics: Severe skin irritant. Causes second- and third-degree burns on short contact and is very injurious to the eyes.	
3.12 Odor Threshold: Currently not available 3.13IDLH 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	7. SHIPPING INFORMATION
4.1 Flash Point: Not flammable	7.1 Grades of Purity: FP Acid No. 2, 90+%; Commercial, 96+% plus 3.5% monofluorophosphoric acid
4.2 Flammable Limits in Air: Not flammable	7.2 Storage Temperature: Ambient
4.3 Fire Extinguishing Agents: Not pertinent	7.3 Inert Atmosphere: No requirement
4.4 Fire Extinguishing Agents Not to Be Used: Do not use water on adjacent fires.	7.4 Venting: Pressure-vacuum
4.5 Special Hazards of Combustion Products: Irritating and toxic fumes of hydrogen fluoride and phosphoric acid may be formed in fires.	7.5 IMO Pollution Category: Currently not available
4.6 Behavior in Fire: Not pertinent	7.6 Ship Type: Currently not available
4.7 Auto Ignition Temperature: Not pertinent	7.7 Barge Hull Type: Currently not available
4.8 Electrical Hazards: Not pertinent	
4.9 Burning Rate: Not pertinent	
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	
8. HAZARD CLASSIFICATIONS	9. PHYSICAL & CHEMICAL PROPERTIES
8.1 49 CFR Category: Corrosive material	9.1 Physical State at 15°C and 1 atm: Liquid
8.2 49 CFR Class: 8	9.2 Molecular Weight: 103.0
8.3 49 CFR Package Group: II	9.3 Boiling Point at 1 atm: 241°F = 116°C = 389°K
8.4 Marine Pollutant: No	9.4 Freezing Point: -139°F = -95°C = 178°K
8.5 NFPA Hazard Classification: Not listed	9.5 Critical Temperature: Not pertinent
8.6 EPA Reportable Quantity: Not listed.	9.6 Critical Pressure: Not pertinent
8.7 EPA Pollution Category: Not listed.	9.7 Specific Gravity: 1.583 at 25°C (liquid)
8.8 RCRA Waste Number: Not listed	9.8 Liquid Surface Tension: Currently not available
8.9 EPA FWPCA List: Not listed	9.9 Liquid Water Interfacial Tension: Not pertinent
5. CHEMICAL REACTIVITY	9.10 Vapor (Gas) Specific Gravity: Not pertinent
5.1 Reactivity with Water: Reacts vigorously to form corrosive and toxic hydrofluoric acid.	9.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent
5.2 Reactivity with Common Materials: In the presence of moisture, is corrosive to glass, other siliceous materials, and most metals.	9.12 Latent Heat of Vaporization: 140 Btu/lb = 77 cal/g = 3.2 X 10 <sup>6</sup> J/kg
5.3 Stability During Transport: Stable	9.13 Heat of Combustion: Not pertinent
5.4 Neutralizing Agents for Acids and Caustics: Flush with water, rinse with sodium bicarbonate or lime solution.	9.14 Heat of Decomposition: Not pertinent
5.5 Polymerization: Not pertinent	9.15 Heat of Solution: Currently not available
5.6 Inhibitor of Polymerization: Not pertinent	9.16 Heat of Polymerization: Not pertinent
6. WATER POLLUTION	9.17 Heat of Fusion: Currently not available
6.1 Aquatic Toxicity: Currently not available	9.18 Limiting Value: Currently not available
6.2 Waterfowl Toxicity: Currently not available	9.19 Reid Vapor Pressure: Currently not available
6.3 Biological Oxygen Demand (BOD): None	
6.4 Food Chain Concentration Potential: None	
6.5 GESAMP Hazard Profile: Bioaccumulation: 0 Damage to living resources: 1 Human Oral hazard: 3 Human Contact hazard: II Reduction of amenities: XXX	

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
34	99.809	51	0.500	51	1.209		N
36	99.740	52	0.500	52	1.209		O
38	99.669	53	0.500	53	1.209		T
40	99.599	54	0.500	54	1.209		P
42	99.530	55	0.500	55	1.209		E
44	99.459	56	0.500	56	1.209		R
46	99.389	57	0.500	57	1.209		T
48	99.320	58	0.500	58	1.209		I
50	99.250	59	0.500	59	1.209		N
52	99.179	60	0.500	60	1.209		E
54	99.110	61	0.500	61	1.209		N
56	99.040	62	0.500	62	1.209		E
58	98.969	63	0.500	63	1.209		N
60	98.900	64	0.500	64	1.209		E
62	98.830	65	0.500	65	1.209		N
64	98.770	66	0.500	66	1.209		E
66	98.700	67	0.500	67	1.209		N
68	98.629	68	0.500	68	1.209		E
70	98.559	69	0.500	69	1.209		N
72	98.490	70	0.500	70	1.209		E
74	98.419	71	0.500	71	1.209		N
76	98.349	72	0.500	72	1.209		E
78	98.280	73	0.500	73	1.209		N
80	98.209	74	0.500	74	1.209		E
82	98.139	75	0.500	75	1.209		N
84	98.070	76	0.500	76	1.209		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
R		125	1.921	125	0.03153		N
E		130	2.132	130	0.03469		O
A		135	2.362	135	0.03811		T
C		140	2.613	140	0.04180		P
T		145	2.885	145	0.04577		E
S		150	3.180	150	0.05005		R
		155	3.500	155	0.05463		T
		160	3.846	160	0.05955		I
		165	4.220	165	0.06482		N
		170	4.624	170	0.07046		E
		175	5.058	175	0.07648		N
		180	5.526	180	0.08290		E
		185	6.029	185	0.08974		R
		190	6.569	190	0.09703		T
		195	7.148	195	0.10480		P
		200	7.768	200	0.11300		E
		205	8.432	205	0.12170		N
		210	9.140	210	0.13100		E
		215	9.897	215	0.14080		R
		220	10.700	220	0.15110		T
		225	11.560	225	0.16200		P
		230	12.480	230	0.17360		E
		235	13.450	235	0.18570		N
		240	14.480	240	0.19860		E
		245	15.570	245	0.21210		R