

BROMINE PENTAFLUORIDE

BPF

CAUTIONARY RESPONSE INFORMATION

Common Synonyms	Liquefied gas Colorless Irritating odor
	Reacts violently with water. Poisonous vapor is produced.
	<p>Restrict access. Evacuate. Avoid contact with liquid and vapor. Notify local health and pollution control agencies. Protect water intakes.</p>
Fire	<p>Not flammable. May cause fire on contact with combustibles. Will increase the intensity of a fire. POISONOUS GASES MAY BE PRODUCED IN FIRE. Containers may explode in fire. Wear goggles and self-contained breathing apparatus. DO NOT USE WATER OR FOAM ON FIRE.</p>
Exposure	<p>CALL FOR MEDICAL AID.</p> <p>VAPOR Irritating to eyes, nose and throat. If inhaled will cause coughing or difficult breathing. If in eyes, hold eyelids open and flush with plenty of water. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.</p> <p>LIQUID 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. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.</p>
Water Pollution	<p>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.</p>

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge
Chemical and Physical Treatment:
Neutralize
Do not add water to undissolved material
Do not burn

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: Not listed.
2.2 Formula: BrF₅
2.3 IMO/UN Designation: 8/1745
2.4 DOT ID No.: 1745
2.5 CAS Registry No.: 7789-30-2
2.6 NAERG Guide No.: 144
2.7 Standard Industrial Trade Classification: 52241

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Self-contained breathing apparatus, acid suit, and gloves
3.2 **Symptoms Following Exposure:** Chemical is highly corrosive and toxic. Inhalation causes severe burns of mucous membrane. Ingestion causes severe burns of mouth. Contact with eyes or skin causes severe burns.
3.3 **Treatment of Exposure:** Get medical attention IMMEDIATELY for any exposure to this chemical, even if no adverse effects are evident. **INHALATION:** remove victim from area; apply artificial respiration if breathing has ceased. **INGESTION:** give large amount of water. **EYES:** wash with copious amounts of water for 15 min. **SKIN:** wash with large amounts of water and follow with lime water; remove contaminated clothing.
3.4 **TLV-TWA:** 0.1 ppm
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:** 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 flammable. Chemical is strong oxidizer and may cause fire in contact with organic materials such as wood, cotton, or straw.
4.2 **Flammable Limits in Air:** Not flammable
4.3 **Fire Extinguishing Agents:** Not pertinent
4.4 **Fire Extinguishing Agents Not to Be Used:** Do not use water or foam on adjacent fires.
4.5 **Special Hazards of Combustion Products:** Toxic and irritating fumes of hydrogen fluoride and bromine may form in fires.
4.6 **Behavior in Fire:** Containers may burst when exposed to heat of fire.
4.7 **Auto Ignition Temperature:** Not pertinent
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

5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** Reacts violently with water, evolving hydrogen fluoride, an extremely irritating and corrosive gas.
5.2 **Reactivity with Common Materials:** Reacts violently with many metals and materials of construction such as wood, glass, some plastics.
5.3 **Stability During Transport:** Stable
5.4 **Neutralizing Agents for Acids and Caustics:** Flush with water.
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:**
Bioaccumulation: 0
Damage to living resources: (3)
Human Oral hazard: (3)
Human Contact hazard: II
Reduction of amenities: XX

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Technical, 98.0+%; Pure, 99.9%
7.2 **Storage Temperature:** Ambient
7.3 **Inert Atmosphere:** Padded
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:** Oxidizer
8.2 **49 CFR Class:** 5.1
8.3 **49 CFR Package Group:** I
8.4 **Marine Pollutant:** No
8.5 **NFPA Hazard Classification:**
- | Category | Classification |
|---------------------------|----------------|
| Health Hazard (Blue)..... | 4 |
| Flammability (Red)..... | 0 |
| Instability (Yellow)..... | 3 |
| Special (White)..... | W OX |
- 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:** Liquid
9.2 **Molecular Weight:** 174.9
9.3 **Boiling Point at 1 atm:** 106°F = 41°C = 314°K
9.4 **Freezing Point:** -76°F = -60°C = 213°K
9.5 **Critical Temperature:** 386.6°F = 197°C = 470.2°K
9.6 **Critical Pressure:** Currently not available
9.7 **Specific Gravity:** 2.48 at 20°C (liquid)
9.8 **Liquid Surface Tension:** Currently not available
9.9 **Liquid Water Interfacial Tension:** Not pertinent
9.10 **Vapor (Gas) Specific Gravity:** 6.03
9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.089 at 25°C
9.12 **Latent Heat of Vaporization:** 76.8 Btu/lb = 42.7 cal/g = 1.79 X 10⁵ J/kg
9.13 **Heat of Combustion:** Not pertinent
9.14 **Heat of Decomposition:** Not pertinent
9.15 **Heat of Solution:** Currently not available
9.16 **Heat of Polymerization:** Not pertinent
9.17 **Heat of Fusion:** 7.07 cal/g
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
45	157.599		N		N		N
50	157.000		O		O		O
55	156.400		T		T		T
60	155.799						
65	155.199		P		P		P
70	154.599		E		E		E
75	154.000		R		R		R
80	153.400		T		T		T
85	152.801		I		I		I
90	152.199		N		N		N
95	151.599		E		E		E
100	151.000		N		N		N
105	150.400		T		T		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
	R	45	3.542	45	0.11430		N
	E	50	4.039	50	0.12910		O
	A	55	4.593	55	0.14540		T
	C	60	5.212	60	0.16340		
	T	65	5.899	65	0.18320		P
	S	70	6.661	70	0.20490		E
		75	7.504	75	0.22870		R
		80	8.436	80	0.25470		T
		85	9.463	85	0.28310		I
		90	10.590	90	0.31400		N
		95	11.830	95	0.34760		E
		100	13.190	100	0.38410		N
		105	14.680	105	0.42360		T
		110	16.300	110	0.46630		I
		115	18.080	115	0.51250		N
		120	20.000	120	0.56230		E
		125	22.100	125	0.61590		N
		130	24.370	130	0.67350		T
		135	26.840	135	0.73530		I
		140	29.500	140	0.80160		N
		145	32.380	145	0.87250		E
		150	35.490	150	0.94840		N
		155	38.830	155	1.02900		T