

HYDROFLUOROSILICIC ACID (25% OR LESS)

HFS

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Fluorosilicic acid HFSA	Liquid	Colorless to straw yellow	None to slight acid
<p>Wear full impervious protective clothing and approved respirator. Neutralize spilled material with lime, then flush with water. Notify local health and pollution control agencies. Protect water intakes.</p>			
Fire	Not flammable. Cool exposed containers with water to avoid overheating. Avoid direct contact of water with acid to reduce splattering and overheating.		
Exposure	CALL FOR MEDICAL AID. VAPOR Move victim to fresh air. If breathing is difficult, give oxygen. LIQUID Irritating to skin and eyes. Remove contaminated clothing and shoes. Flush skin with water. IF IN EYES, hold eyelids open and flush with plenty of water. If swallowed and victim is conscious, give large quantity of water followed by milk of magnesia or milk.		
Water Pollution	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 Stop discharge Dilute and disperse Chemical and Physical Treatment: Neutralize	2. CHEMICAL DESIGNATIONS 2.1 CG Compatibility Group: 1; Non-oxidizing Mineral Acids 2.2 Formula: H ₂ SiF ₆ 2.3 IMO/UN Designation: Currently not available 2.4 DOT ID No.: 1778 2.5 CAS Registry No.: 16961-83-4 2.6 NAERG Guide No.: 154 2.7 Standard Industrial Trade Classification: 52236
3. HEALTH HAZARDS 3.1 Personal Protective Equipment: Wear full impervious protective clothing and approved respirator. Where splashing is possible wear full face shield or chemical safety goggles. Use approved respirator to protect against vapors. 3.2 Symptoms Following Exposure: Acute contact will cause severe eye and skin burns. Acute vapor exposure may cause eye and skin irritation. Chronic exposure may cause osteofluorosis and respiratory impairment. 3.3 Treatment of Exposure: Get medical attention. INHALATION: Remove to fresh air. If breathing is difficult, give oxygen. EYES: Flush with water for at least 15 min., lifting lids occasionally. SKIN: Remove contaminated clothing and shoes. Flush with water. INGESTION: Dilute with milk, lime water, or aluminum hydroxide. 3.4 TLV-TWA: Not listed. 3.5 TLV-STEL: Not listed. 3.6 TLV-Ceiling: Not listed. 3.7 Toxicity by Ingestion: Grade 3; oral guinea pig LD ₅₀ = 200 mg/kg 3.8 Toxicity by Inhalation: Currently not available. 3.9 Chronic Toxicity: Kidneys, liver, and lungs may be affected by exposures. Osteofluorosis is softening of the bones. 3.10 Vapor (Gas) Irritant Characteristics: Vapors are moderately irritating such that personnel will not usually tolerate moderate or high concentrations. 3.11 Liquid or Solid Characteristics: Fairly severe skin irritant. May cause pain and second-degree burns after a few minutes' contact. 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.
- 4.2 **Flammable Limits in Air:** Not pertinent.
- 4.3 **Fire Extinguishing Agents:** Use dry
chemical, carbon dioxide or water spray
on adjacent fires.
- 4.4 **Fire Extinguishing Agents Not to Be
Used:** Avoid direct contact between
water and acid.
- 4.5 **Special Hazards of Combustion
Products:** Not pertinent.
- 4.6 **Behavior in Fire:** Not pertinent.
- 4.7 **Auto Ignition Temperature:** Not
pertinent.
- 4.8 **Electrical Hazards:** Not pertinent.
- 4.9 **Burning Rate:** Not pertinent.
- 4.10 **Adiabatic Flame Temperature:** Not
pertinent.
- 4.11 **Stoichiometric Air to Fuel Ratio:** Not
pertinent
- 4.12 **Flame Temperature:** Not pertinent.
- 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 with
generation of heat.
- 5.2 **Reactivity with Common Materials:** Can
react with strong acids to release
hydrogen fluoride fumes. Will react with
metals to release hydrogen gas. Will
attack glass and materials containing
silica.
- 5.3 **Stability During Transport:** Stable.
- 5.4 **Neutralizing Agents for Acids and
Caustics:** Lime.
- 5.5 **Polymerization:** Will not polymerize.
- 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):**
Currently not available
- 6.4 **Food Chain Concentration Potential:**
Currently not available
- 6.5 **GESAMP Hazard Profile:** Not listed

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Varying concentrations
available.
- 7.2 **Storage Temperature:** Ambient.
- 7.3 **Inert Atmosphere:** No requirement.
- 7.4 **Venting:** Pressure vacuum valve.
- 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:** Corrosive Material
- 8.2 **49 CFR Class:** 8
- 8.3 **49 CFR Package Group:** II
- 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:** Liquid
- 9.2 **Molecular Weight:** 144.08
- 9.3 **Boiling Point at 1 atm:** Decomposes.
- 9.4 **Freezing Point:** Currently not available
- 9.5 **Critical Temperature:** Currently not available
- 9.6 **Critical Pressure:** Currently not available
- 9.7 **Specific Gravity:** 1.25
- 9.8 **Liquid Surface Tension:** Currently not
available
- 9.9 **Liquid Water Interfacial Tension:** Currently
not available
- 9.10 **Vapor (Gas) Specific Gravity:** Currently not
available
- 9.11 **Ratio of Specific Heats of Vapor (Gas):**
Currently not available
- 9.12 **Latent Heat of Vaporization:** Currently not
available
- 9.13 **Heat of Combustion:** Not pertinent.
- 9.14 **Heat of Decomposition:** Currently not
available
- 9.15 **Heat of Solution:** Currently not available
- 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
60	10.300		C U R R E N T L Y N O T A V A I L A B L E		C U R R E N T L Y N O T A V A I L A B L E		C U R R E N T L Y N O T A V A I L A B L 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
	M I S C I B L E	77	0.464	77	0.01161		C U R R E N T L Y N O T A V A I L A B L E