

# HYDROFLUOROSILICIC ACID (25% OR LESS)

HFS

CAUTIONARY RESPONSE INFORMATION				4. FIRE HAZARDS	7. SHIPPING INFORMATION
Common Synonyms Fluorosilic acid HFSA	Liquid	Colorless to straw yellow	None to slight acrid	<p><b>4.1 Flash Point:</b> Not flammable.</p> <p><b>4.2 Flammable Limits in Air:</b> Not pertinent.</p> <p><b>4.3 Fire Extinguishing Agents:</b> Use dry chemical, carbon dioxide or water spray on adjacent fires.</p> <p><b>4.4 Fire Extinguishing Agents Not to Be Used:</b> Avoid direct contact between water and acid.</p> <p><b>4.5 Special Hazards of Combustion Products:</b> Not pertinent.</p> <p><b>4.6 Behavior in Fire:</b> Not pertinent.</p> <p><b>4.7 Auto Ignition Temperature:</b> Not pertinent.</p> <p><b>4.8 Electrical Hazards:</b> Not pertinent.</p> <p><b>4.9 Burning Rate:</b> Not pertinent.</p> <p><b>4.10 Adiabatic Flame Temperature:</b> Not pertinent.</p> <p><b>4.11 Stoichiometric Air to Fuel Ratio:</b> Not pertinent.</p> <p><b>4.12 Flame Temperature:</b> Not pertinent.</p> <p><b>4.13 Combustion Molar Ratio (Reactant to Product):</b> Not pertinent</p> <p><b>4.14 Minimum Oxygen Concentration for Combustion (MOCC):</b> Not listed</p>	<p><b>7.1 Grades of Purity:</b> Varying concentrations available.</p> <p><b>7.2 Storage Temperature:</b> Ambient.</p> <p><b>7.3 Inert Atmosphere:</b> No requirement.</p> <p><b>7.4 Venting:</b> Pressure vacuum valve.</p> <p><b>7.5 IMO Pollution Category:</b> Currently not available</p> <p><b>7.6 Ship Type:</b> Currently not available</p> <p><b>7.7 Barge Hull Type:</b> Currently not available</p>
<b>Fire</b>	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><b>8. HAZARD CLASSIFICATIONS</b></p> <p><b>8.1 49 CFR Category:</b> Corrosive Material</p> <p><b>8.2 49 CFR Class:</b> 8</p> <p><b>8.3 49 CFR Package Group:</b> II</p> <p><b>8.4 Marine Pollutant:</b> No</p> <p><b>8.5 NFPA Hazard Classification:</b> Not listed</p> <p><b>8.6 EPA Reportable Quantity:</b> Not listed.</p> <p><b>8.7 EPA Pollution Category:</b> Not listed.</p> <p><b>8.8 RCRA Waste Number:</b> Not listed</p> <p><b>8.9 EPA FWPCA List:</b> Not listed</p>	
<b>Exposure</b>	<p><b>CALL FOR MEDICAL AID.</b></p> <p><b>VAPOR</b> Move victim to fresh air. If breathing is difficult, give oxygen.</p> <p><b>LIQUID</b> 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.</p>			<p><b>9. PHYSICAL &amp; CHEMICAL PROPERTIES</b></p> <p><b>9.1 Physical State at 15° C and 1 atm:</b> Liquid</p> <p><b>9.2 Molecular Weight:</b> 144.08</p> <p><b>9.3 Boiling Point at 1 atm:</b> Decomposes.</p> <p><b>9.4 Freezing Point:</b> Currently not available</p> <p><b>9.5 Critical Temperature:</b> Currently not available</p> <p><b>9.6 Critical Pressure:</b> Currently not available</p> <p><b>9.7 Specific Gravity:</b> 1.25</p> <p><b>9.8 Liquid Surface Tension:</b> Currently not available</p> <p><b>9.9 Liquid Water Interfacial Tension:</b> Currently not available</p> <p><b>9.10 Vapor (Gas) Specific Gravity:</b> Currently not available</p> <p><b>9.11 Ratio of Specific Heats of Vapor (Gas):</b> Currently not available</p> <p><b>9.12 Latent Heat of Vaporization:</b> Currently not available</p> <p><b>9.13 Heat of Combustion:</b> Not pertinent.</p> <p><b>9.14 Heat of Decomposition:</b> Currently not available</p> <p><b>9.15 Heat of Solution:</b> Currently not available</p> <p><b>9.16 Heat of Polymerization:</b> Not pertinent.</p> <p><b>9.17 Heat of Fusion:</b> Currently not available</p> <p><b>9.18 Limiting Value:</b> Currently not available</p> <p><b>9.19 Reid Vapor Pressure:</b> Currently not available</p>	
<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.			<p><b>5. CHEMICAL REACTIVITY</b></p> <p><b>5.1 Reactivity with Water:</b> Reacts with generation of heat.</p> <p><b>5.2 Reactivity with Common Materials:</b> 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.</p> <p><b>5.3 Stability During Transport:</b> Stable.</p> <p><b>5.4 Neutralizing Agents for Acids and Caustics:</b> Lime</p> <p><b>5.5 Polymerization:</b> Will not polymerize.</p> <p><b>5.6 Inhibitor of Polymerization:</b> Not pertinent.</p>	
<p><b>1. CORRECTIVE RESPONSE ACTIONS</b></p> <p>Stop discharge Dilute and disperse Chemical and Physical Treatment: Neutralize</p>		<p><b>2. CHEMICAL DESIGNATIONS</b></p> <p><b>2.1 CG Compatibility Group:</b> 1; Non-oxidizing Mineral Acids</p> <p><b>2.2 Formula:</b> <math>H_2SiF_6</math></p> <p><b>2.3 IMO/UN Designation:</b> Currently not available</p> <p><b>2.4 DOT ID No.:</b> 1778</p> <p><b>2.5 CAS Registry No.:</b> 16961-83-4</p> <p><b>2.6 NAERG Guide No.:</b> 154</p> <p><b>2.7 Standard Industrial Trade Classification:</b> 52236</p> <p><b>3. HEALTH HAZARDS</b></p> <p><b>3.1 Personal Protective Equipment:</b> 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.</p> <p><b>3.2 Symptoms Following Exposure:</b> 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.</p> <p><b>3.3 Treatment of Exposure:</b> 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.</p> <p><b>3.4 TLV-TWA:</b> Not listed.</p> <p><b>3.5 TLV-STEL:</b> Not listed.</p> <p><b>3.6 TLV-Ceiling:</b> Not listed.</p> <p><b>3.7 Toxicity by Ingestion:</b> Grade 3; oral guinea pig LD<sub>50</sub> = 200 mg/kg</p> <p><b>3.8 Toxicity by Inhalation:</b> Currently not available.</p> <p><b>3.9 Chronic Toxicity:</b> Kidneys, liver, and lungs may be affected by exposures. Osteofluorosis is softening of the bones.</p> <p><b>3.10 Vapor (Gas) Irritant Characteristics:</b> Vapors are moderately irritating such that personnel will not usually tolerate moderate or high concentrations.</p> <p><b>3.11 Liquid or Solid Characteristics:</b> Fairly severe skin irritant. May cause pain and second-degree burns after a few minutes' contact.</p> <p><b>3.12 Odor Threshold:</b> Currently not available</p> <p><b>3.13 IDLH Value:</b> Not listed.</p> <p><b>3.14 OSHA PEL-TWA:</b> Not listed.</p> <p><b>3.15 OSHA PEL-STEL:</b> Not listed.</p> <p><b>3.16 OSHA PEL-Ceiling:</b> Not listed.</p> <p><b>3.17 EPA AEGL:</b> Not listed</p>	<p><b>6. WATER POLLUTION</b></p> <p><b>6.1 Aquatic Toxicity:</b> Currently not available</p> <p><b>6.2 Waterfowl Toxicity:</b> Currently not available</p> <p><b>6.3 Biological Oxygen Demand (BOD):</b> Currently not available</p> <p><b>6.4 Food Chain Concentration Potential:</b> Currently not available</p> <p><b>6.5 GESAMP Hazard Profile:</b> Not listed</p>	<p><b>NOTES</b></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
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