

# MATERIAL SAFETY DATA SHEET

**HYDROFLUOSILICIC ACID 23%**

**MSDS ID:** AC0025

**Revised:** 07-24-2008

**Replaces:** 10-27-2005

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** HYDROFLUOSILICIC ACID 23%  
**MSDS ID:** AC0025  
**Synonyms:** Hydrofluorosilicic Acid; Fluorosilicic Acid; Fluosilicic Acid; Hexafluosilicic Acid; HFS; FSA; Silicate(2-), hexafluoro-, dihydrogen  
**CAS Number:** 16961-83-4  
**Chemical Family:** Inorganic Acid  
**Formula:** H<sub>2</sub>SiF<sub>6</sub>

**DISTRIBUTED BY:**  
Hydrite Chemical Co.  
300 N. Patrick Blvd.  
Brookfield, WI 53008-0948  
(262) 792-1450

**EMERGENCY RESPONSE NUMBERS:**  
24 Hour Emergency #: (414) 277-1311  
CHEMTREC Emergency #: (800) 424-9300

**MANUFACTURED BY:** Solvay Fluorides, LLC

## 2. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW:** DANGER! CORROSIVE. Causes severe burns to eyes, skin, and respiratory tract. Harmful if inhaled. Harmful if swallowed. Contact with water may generate toxic, irritating and corrosive gases.

**Physical State:** Liquid.  
**Color:** Colorless.  
**Odor:** Pungent.

### POTENTIAL HEALTH EFFECTS

**Routes Of Exposure:** Eyes. Ingestion. Inhalation. Skin. Absorption.

**Target Organs:** Respiratory System. Kidneys. Liver. Eyes.

**Eye Contact:** CORROSIVE-Causes severe irritation and burns. Causes: watering. redness. swelling. May cause: serious eye damage. permanent eye damage. blindness.

**Skin Contact:** CORROSIVE-Causes severe irritation and burns. Causes: painful irritation. redness. swelling. severe burns. Effects may be slow to heal.

**Skin Absorption:** Absorption may cause: shock. hypocalcemia following the extent of the lesions.

**Inhalation:** CORROSIVE-Causes severe irritation and burns. Causes: spasmodic cough. difficulty breathing. May cause: chemical pneumonitis. pulmonary edema. Inhalation of high concentrations may cause: hypocalcemia. nervous problems (tetany). cardiac arrhythmia (heart irregularity). Prolonged or repeated contact may cause: sore throat. nose bleeds. chronic bronchitis.

**Ingestion:** CORROSIVE-Causes severe irritation and burns. May cause severe burns to the: mouth. throat. May cause: perforation of the esophagus. perforation of the stomach. throat edema. suffocation. abdominal cramps. nausea. vomiting (bloody). bloody diarrhea. coughing. difficulty in breathing. convulsions.

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unconsciousness. coma. cardiopulmonary arrest. hypocalcemia with nervous disorders (tetany) and cardiac rhythm disorders. general symptoms having a severe prognosis.

**Medical Conditions Aggravated By Exposure To Product:** No data available.

**Other:** Chronic exposure at high concentrations can cause bone fluorosis. Seriousness of lesions and prognosis of intoxication depend directly on the concentration and duration of exposure.

**Cancer Information:** This product does not contain 0.1% or more of the known or potential carcinogens listed in NTP, IARC, or OSHA.

**Potential Environmental Effects:** See Section 12.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Component</u>	<u>CAS Number</u>	<u>OSHA Hazard</u>	<u>% by Wt.</u>
Water	7732-18-5	NO	75 - 77 %
Hydrofluosilicic Acid	16961-83-4	YES	23 - 25 %

### 4. FIRST-AID MEASURES

**Eye Contact:** Immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids open. Tilt head to avoid contaminating unaffected eye. Get immediate medical attention. If there is difficulty opening the lids, administer an analgesic eye wash (oxybuprocaine).

**Skin Contact:** Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Do not reuse clothing and shoes until cleaned. Keep warm (blanket); provide clean clothing.

**Inhalation:** Remove to fresh air. If breathing is difficult, administer oxygen. If not breathing, give artificial respiration, preferably mouth-to-mouth. GET MEDICAL ATTENTION IMMEDIATELY. Keep warm and quiet.

**Ingestion:** If swallowed, call a physician immediately. DO NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. Rinse mouth with fresh water. DO NOT give anything to drink. If the subject presents nervous, respiratory or cardiovascular disorders: administer oxygen.

**Note to Physicians:** ALL TYPES OF CONTACT SHOULD BE TREATED IMMEDIATELY.

### 5. FIRE FIGHTING MEASURES

**Extinguishing Media:** Not flammable. Not combustible. Use extinguishing agents appropriate for surrounding fire. DO NOT USE: Water.

**Fire Fighting Methods:** Evacuate area of unprotected personnel. Wear protective clothing including NIOSH-approved self-contained breathing apparatus. Remain upwind of fire to avoid hazardous vapors and decomposition products. Use water spray to cool fire-exposed containers and disperse vapors. Water spray may be useful in minimizing or dispersing vapors. Contact with water liberates hazardous gas.

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**Fire And Explosion Hazards:** Product may react with some metals (ex.: Aluminum, Zinc, Tin, etc.) to release flammable hydrogen gas.

**Hazardous Combustion Products:** Thermal decomposition may release: Hazardous fumes or hazardous decomposition products.

## 6. ACCIDENTAL RELEASE MEASURES

**Spill Clean-Up Procedures:** CORROSIVE MATERIAL. Evacuate unprotected personnel from area. Maintain adequate ventilation. Follow personal protective equipment recommendations found in Section 8. Never exceed any occupational exposure limit. Shut off source of leak if safe to do so. Keep upwind of leak or spill. Use water spray to control vapor. Contain spills immediately with inert materials (e.g., sand, earth). Place in non-leaking containers for immediate disposal. Dilute with plenty of water. To avoid excess fuming, do not apply water directly onto the spillage, but upstream or on a run off. Neutralize with an alkali (sodium carbonate, lime, etc.) Absorb spill with inert material and dispose of properly. Flush remaining area with water to remove trace residue and dispose of properly. Avoid direct discharge to sewers and surface waters. Notify authorities if entry occurs.

## 7. HANDLING AND STORAGE

**Handling:** Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Do not swallow. Avoid breathing vapors, mists, or dust. Do not eat, drink, or smoke in work area. Wash thoroughly after handling. Provide tight electrical equipment well protected against corrosion. Use only equipment and materials which are compatible with the product. Use in closed system. Handle in small quantities under a lab hood. Preferably transfer by pump or gravity.

**Storage:** CORROSIVE MATERIAL. Store in a cool, well ventilated area, out of direct sunlight. Store in a dry location away from heat. Keep away from incompatible materials. Keep containers tightly closed. Do not store in unlabeled or mislabeled containers. Keep in a diked area. Highly corrosive to most metals with evolution of hydrogen gas.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Exposure Guidelines:**

<u>Component</u>	<u>OSHA PEL</u>	<u>OSHA STEL/C</u>	<u>ACGIH TWA</u>	<u>ACGIH STEL/C</u>
Water	Not Estab.	Not Estab.	Not Estab.	Not Estab.
Hydrofluosilicic Acid	*2.5 mg/m3	Not Estab.	*2.5 mg/m3	Not Estab.

**Note:** \* Exposure Limit for Fluorides, as F.

**Engineering Controls:** General room ventilation and local exhaust are required. Maintain adequate ventilation. Do not use in closed or confined spaces. Avoid creating dust or mist. Keep levels below exposure limits. To determine exposure levels, monitoring should be performed regularly.

**Eye/Face Protection:** Wear chemical safety goggles and a full face shield while handling this product.

**Skin Protection:** Prevent contact with this product. Wear gloves and protective clothing depending on condition of use. Protective gloves: Butyl rubber.

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**Respiratory Protection:** Respiratory protection must be worn if ventilation does not eliminate symptoms or keep levels below recommended exposure limits. If exposure limits are exceeded, wear: NIOSH-Approved air-purifying respirator with: Acid gas cartridge. In a confined or poorly ventilated area, wear: NIOSH-Approved self-contained breathing apparatus. DO NOT exceed limits established by the respirator manufacturer. All respiratory protection programs must comply with OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements and must be followed whenever workplace conditions require a respirator's use.

**Other Protective Equipment:** Eye-wash station. Safety shower. Rubber apron. Rubber boots. Protective clothing.

**General Hygiene Conditions:** Wash with soap and water before meal times and at the end of each work shift.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical State:** Liquid.

**Color:** Colorless.

**Odor:** Pungent.

**Boiling Point (deg. F):** 227.3 (Decomposes at 226F)

**Freezing Point (deg. F):** < - 22

**Melting Point (deg. F):** N.D.

**Vapor Pressure (mm Hg):** from 22.5 @ 68 F

**Vapor Density (air=1):** > 1

**Solubility in Water:** Completely miscible

**pH:** 1 @ 100 g/l

**Specific Gravity:** 1.32 @ 68 F

**% Volatile (wt%):** N.D.

**Evaporation Rate (nBuAc = 1):** N.D.

**VOC (wt%):** 0

**VOC (lbs/gal):** 0

**Viscosity:** N.D.

**Flash Point:** Not combustible.

**Flash Point Method:** N.A.

**Lower Explosion Limit:** N.D.

**Upper Explosion Limit:** N.D.

**Autoignition Temperature:** No Data

## 10. STABILITY AND REACTIVITY

**Stability:** Stable under normal conditions.

**Conditions To Avoid:** Avoid heating the product to its decomposition temperature.

**Incompatible Materials:** Metals. Strong oxidizing agents. Glass.

**Hazardous Decomposition Products:** Hydrogen gas. Hydrogen fluoride.

**Possibility of Hazardous Reactions:** Hazardous polymerization will not occur under normal conditions. May react with certain metals to produce flammable hydrogen gas. Explosive mixtures in contact with alkaline materials (Na, K, Li). Reacts violently with water.

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## 11. TOXICOLOGICAL INFORMATION

**LD50 Oral:** No Data

**LD50 Skin:** No Data

**LC50 Inhalation:** Rat: 850 - 1070 mg/m<sup>3</sup>/1 h

Oral: LC100 (guinea pig): 80 mg/kg (2% solution)

Chronic toxicity:

Inhalation, Prolonged exposure, rat, Target Organs: Respiratory system, kidney, liver, eyes, observed effect, (hydrofluoric acid)

Genetic toxicity in vitro:

In vitro, Animal testing did not show any mutagenic effects.

Remarks:

Corrosive effect linked to acid properties of the product.

Chronic exposure may entail dental or skeletal fluorosis.

## 12. ECOLOGICAL INFORMATION

**Ecotoxicological Information:** Acute Toxicity:

Fishes, *Salmo gairdneri*, LC50, 96 h, 51 mg/l (Fluorides)

Remarks: 10 mg HF/l: pH = 3.15; 100 mg HF/l: pH = 2.65

Crustaceans, *Daphnia magna*, EC50, 48 h, 97 mg/l (Fluorides)

Remarks: fresh water

Crustaceans, *Mysidopsis bahia*, EC50, 96 h, 10.5 mg/l (Fluorides)

Remarks: salt water

Chronic Toxicity:

Fishes, *Salmo gairdneri*, LC50, 21 Days, from 2.7 - 4.7 mg/l (Fluorides)

Crustaceans, *Daphnia magna*, NOEC, 21 Days, 3.7 mg/l (Fluorides)

Algae, *Scenedesmus* sp., EC50, 96 h, 43 mg/l (Fluorides)

**Chemical Fate Information:** Mobility:

-Air: mobile in aerosol form.

-Water: considerable solubility and mobility.

-Soil/sediments (Fluorides): absorption on mineral soil constituents. Conditions: slightly acid pH.

Persistence and degradability:

Abiotic degradation:

-Air: neutralization by natural alkalinity.

-Water/soil (Fluorides): complexation/precipitation of inorganic materials. Degradation Products: aluminum/iron/calcium/phosphate complexes and/or precipitates as a function of pH.

-Water/soil: ionization/neutralization.

Biodegradation:

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-The methods for determining biodegradability are not applicable to inorganic substances.

Bioaccumulative potential:

-Bioconcentration: log Pow  
not applicable (ionizable inorganic compound)  
-(Fluorides)  
accumulation into vegetable leaves.

Remarks:

-No specific data.

-Harmful to aquatic organisms.

-Hazard for the aquatic environment is limited due to product properties:

-low chronic toxicity.

-Product fate is highly depending on environmental conditions: pH, temperature, oxidoreductive potential, mineral and organic content of the medium...

## 13. DISPOSAL CONSIDERATIONS

**Hazardous Waste Number:** D002

**Disposal Method:** Dispose of in a permitted hazardous waste management facility following all local, state and federal regulations. Since emptied containers retain product residue, follow label warnings even after container is emptied.

## 14. TRANSPORTATION INFORMATION

**DOT (Department of Transportation):**

**Proper Shipping Name:** FLUOROSILICIC ACID

**Hazard Class:** 8

**Identification Number:** UN1778

**Packing Group:** II

**Label Required:** CORROSIVE

## 15. REGULATORY INFORMATION

### U.S. FEDERAL REGULATIONS

**TSCA Inventory Status:** All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

**SARA Title III Section 311/312 Category:**

**Immediate (Acute) Health Hazard:** Yes

**Delayed (Chronic) Health Hazard:** Yes

**Fire Hazard:** No

**Sudden Release Of Pressure Hazard:** No

**Reactive Hazard:** Yes

**SARA Section 302/304/313/HAP:**

Component

CERCLA RQ

SARA RQ

SARA TPQ

SARA 313

U.S. HAP

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Water	N.A.	N.A.	N.A.	NO	NO
Hydrofluosilicic Acid	N.A.	N.A.	N.A.	NO	NO

**NSF/ANSI Standard 60 Maximum Use Level:** 6 mg/L.

## U.S. STATE REGULATIONS

**California - The following components are listed under Proposition 65:**

Lead (0.02% max.)

**Wisconsin - The following components are listed as a Wisconsin HAP:**

Fluorides (inorganics), as F.

## 16. ADDITIONAL INFORMATION

### Hydrite Rating System

**Health:** 3\*

**Flammability:** 0

**Reactivity:** 1

\* = Chronic Health Hazard

### NFPA Rating System

**Health:** 3

**Flammability:** 0

**Reactivity:** 1

**Special Hazard:** None

### MSDS Abbreviations

N.A. = Not Applicable

N.D. = Not Determined

HAP = Hazardous Air Pollutant

VOC = Volatile Organic Compound

C = Ceiling Limit

N.E./Not Estab. = Not Established

**MSDS Prepared by:** NAO

**Reason for Revision:** Changes made throughout the MSDS.

The data in this Material Safety Data Sheet relates to the specific material designated and does not relate to its use in combination with any other material or process. The data contained is believed to be correct. However, since conditions of use are outside our control it should not be taken as warranty or representation for which HYDRITE CHEMICAL CO. assumes legal responsibility. This information is provided solely for your consideration, investigation, and verification.