SAFETY DATA SHEET

Issue Date: 15-Aug-2014 **Revision Date:** 05-Mar-2021 **Version** 1

1. Identification

Product identifier
Product Name: Hydrofluosilicic Acid

Other means of identification
Product Code: 41868
Synonyms: Fluorosilicic acid; Hexafluorosilicic acid; Fluosilicic acid; Dihydrogen hexafluorosilicate; FSA; HSA
UN/ID No: UN1778

Recommended use of the chemical and restrictions on use
Recommended Use: Industrial, Manufacturing or Laboratory use.
Restrictions on Use: None known

Details of the supplier of the safety data sheet
Manufacturer: Hawkins, Inc.
2381 Rosegate
Roseville, MN 55113
(612) 331-6910

Emergency telephone number
Emergency Telephone: CHEMTREC: 1-800-424-9300 (US) / +1 703-741-5970 (International)

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Oral	Category 4
Acute toxicity - Dermal	Category 3
Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1
Corrosive to metals	Category 1

Hazards not otherwise classified (HNOC)
Not applicable

Label elements
Signal word: Danger

Hazard statements:
Harmful if swallowed or if inhaled
Toxic in contact with skin
Causes severe skin burns and eye damage
May be corrosive to metals

Precautionary Statements - Prevention:
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Use only outdoors or in a well-ventilated area
Do not breathe dusts or mists
Wear protective gloves/protective clothing/eye protection/face protection
Keep only in original container

Precautionary Statements - Response:
Immediately call a POISON CENTER or doctor
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a POISON CENTER or doctor
Call a POISON CENTER or doctor if you feel unwell
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower
Wash contaminated clothing before reuse
IF INHALED: Remove person to fresh air and keep comfortable for breathing
Immediately call a POISON CENTER or doctor
IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell
Rinse mouth
Do NOT induce vomiting
Absorb spillage to prevent material damage

Precautionary Statements - Storage:
Store locked up
Store in corrosion resistant container with a resistant inner liner

Precautionary Statements - Disposal:
Dispose of contents/container to an approved waste disposal plant

Unknown Acute toxicity:
25 % of the mixture consists of ingredient(s) of unknown acute dermal toxicity
25 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (dust/mist)

Other Information
Not applicable

3. Composition/information on ingredients

Chemical name	CAS No.	Weight-%
Fluorosilicic acid	16961-83-4	23-25
Hydrogen fluoride	7664-39-3	<1
Water	7732-18-5	Balance

Any concentration shown as a range is due to batch variation or the exact percentage has been withheld as a trade secret.

4. First-aid measures

Description of first aid measures

General advice

Show this safety data sheet to the doctor in attendance. Immediate medical attention is required. Hydrofluoric (HF) acid burns require immediate and specialized first aid and medical treatment. Symptoms may be delayed up to 24 hours depending on the concentration of HF. After decontamination with water, further damage can occur due to

penetration/absorption of the fluoride ion. Treatment should be directed toward binding the fluoride ion as well as the effects of exposure. Absorption can readily occur through the subungual areas and should be considered when undergoing decontamination. Conditions such as hypocalcemia, hypomagnesemia and cardiac arrhythmias should be monitored for, since they can occur after exposure.

Inhalation

Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical advice/attention. In addition to standard first aid, trained personnel should administer a nebulized solution of 2.5% calcium gluconate with oxygen.

Eye contact

Get immediate medical advice/attention. Avoid direct contact. Wear chemical protective gloves if necessary. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 15-20 minutes, while holding the eyelid(s) open. Remove contact lenses, if present and easy to do. Take care not to rinse contaminated water into the unaffected eye or onto the face. DO NOT use benzalkonium chloride (Zephiran) for eye contact. If sterile 1% calcium gluconate solution is available, limit flushing with water to 5 minutes. Then, trained personnel should repeatedly irrigate the eye using a syringe filled with 1% calcium gluconate solution.

Skin contact

Get immediate medical advice/attention. Avoid direct contact. Wear chemical protective clothing if necessary. Take off immediately contaminated clothing, shoes, and leather goods (e.g. watchbands, belts). As quickly as possible, flush with lukewarm, gently flowing water until trained personnel can administer benzalkonium chloride solution (Zephiran) or 2.5% calcium gluconate gel. If neither is available, water rinsing must continue until medical treatment is available. Double bag, seal, label, and leave contaminated clothing, shoes, and leather goods at the scene for safe disposal.

Ingestion

Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Get immediate medical advice/attention.

Self-protection of the first aider

Avoid contact with skin, eyes or clothing. Wear personal protective clothing (see section 8). Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation.

Most important symptoms and effects, both acute and delayed

Symptoms

Redness. Burning. May cause blindness. Coughing and/ or wheezing. Hydrofluoric acid is extremely corrosive and can cause very deep and excruciatingly painful burns and tissue loss. Burns are swollen, hot and painful, then develop white or yellowish areas and blistering, with deep ulceration and destruction of tissue, which tends to heal slowly. The severity of the burns and absorption of the acid (with liquefaction necrosis of soft tissue and decalcification and corrosion of the bone) have resulted in permanent scarring, disability and death. Burns from concentrated solutions (greater than 50%) are felt immediately and tissue destruction is readily apparent. Weaker solutions (20 -50%) result in burns that are apparent after several hours. Burns from solutions of less than 20% may take up to 24 hours to become apparent. Weak solutions (less than 7%) penetrate deeply before causing tissue damage and surface involvement may be minimal. Systemic fluoride toxicity has occurred following ingestion. Symptoms such as nausea, vomiting, abdominal pain, reduced heartbeat and blood pressure, shortness of breath have been reported. In some cases, death occurred in less than one hour following ingestion.

Indication of any immediate medical attention and special treatment needed

Note to physicians

Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure. The symptoms of lung oedema often do not become manifest until a few hours have passed

and they are aggravated by physical effort. Rest and medical observation are essential.

5. Fire-fighting measures

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Large Fire CAUTION: Use of water spray when fighting fire may be inefficient.

Unsuitable extinguishing media Do not scatter spilled material with high pressure water streams.

Specific hazards arising from the chemical The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors. Substance will react with water (some violently), releasing corrosive and/or toxic gases. Contact with metals may evolve flammable hydrogen gas.

Hazardous combustion products Hydrogen fluoride (HF). Silicon oxides. Silicon tetrafluoride.

Explosion Data

Sensitivity to mechanical impact None.

Sensitivity to static discharge None.

Special protective equipment for fire-fighters Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Corrosive material. Keep people away from and upwind of spill/leak.

Other information Refer to protective measures listed in Sections 7 and 8.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so. Keep out of drains, sewers, ditches and waterways.

Methods for cleaning up Dike far ahead of liquid spill for later disposal. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Pick up and transfer to properly labeled containers. Clean contaminated surface thoroughly. After cleaning, flush away traces with water.

7. Handling and storage

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Take off contaminated clothing and wash before reuse. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Store locked up. Store in a cool, dry area away from potential sources of heat, open flames, sunlight or other chemicals. Store in accordance with AWWA B703-Fluorosilicic acid.

Incompatible Materials Oxidizing agent. Acids. Bases. Metals. Glass. Carbonates. Cyanide compounds. Sulfides. Acid anhydrides. Chlorites. Organic material.

Packaging materials Use high density polyethylene (HDPE) containers. Do not store in glass for prolonged periods of time. Pack any breakable packaging into closed unbreakable containers.

8. Exposure controls/personal protection

Control parameters

Exposure Limits The following ingredients are the only ingredients of the product above the cut-off level (or level that contributes to the hazard classification of the mixture) which have an exposure limit applicable in the region for which this safety data sheet is intended or other recommended limit. At this time, the other relevant constituents have no known exposure limits from the sources listed here.

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Fluorosilicic acid 16961-83-4	TWA: 2.5 mg/m³ F	TWA: 2.5 mg/m³ F (vacated) TWA: 2.5 mg/m³	IDLH: 250 mg/m³ F TWA: 2.5 mg/m³ F
Hydrogen fluoride 7664-39-3	TWA: 0.5 ppm F TWA: 2.5 mg/m³ F S* Ceiling: 2 ppm F	TWA: 3 ppm F TWA: 2.5 mg/m³ F (vacated) TWA: 3 ppm F (vacated) TWA: 2.5 mg/m³ (vacated) STEL: 6 ppm F	IDLH: 30 ppm IDLH: 250 mg/m³ F Ceiling: 6 ppm 15 min Ceiling: 5 mg/m³ 15 min TWA: 3 ppm TWA: 2.5 mg/m³

Exposure Guidelines Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

Appropriate engineering controls

Engineering controls Showers
Eyewash stations
Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face protection Face protection shield. Tight sealing safety goggles. Contacts should not be worn.

Hand protection Wear suitable gloves. Impervious gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.

Skin and body protection Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

Environmental exposure controls Do not allow into any sewer, on the ground or into any body of water. Local authorities should be advised if significant spillages cannot be contained.

General hygiene considerations Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and immediately after handling the product. Contaminated work clothing should not be allowed out of the workplace.

9. Physical and chemical properties

Information on basic physical and chemical properties

Physical State: Liquid
Appearance: Clear
Color: Colorless to light yellow
Odor: Pungent
Odor Threshold: No information available

pH:	No information available
Salt Out Point:	No information available
Melting Point/Freezing Point:	-16 °C / 4 °F
Boiling Point/Boiling Range:	106 °C / 223 °F
Flash Point:	No information available
Evaporation Rate (BuAc=1):	No information available
Flammability (solid, gas):	No information available
Flammability Limits in Air:	No information available
Vapor Pressure (mm Hg):	No information available
Vapor density (Air =1):	No information available
Specific Gravity (H_2O=1):	1.225
Water Solubility:	No information available
Solubility(ies):	No information available
Partition Coefficient (n-octanol/water):	No information available
Autoignition Temperature:	No information available
Decomposition Temperature:	No information available
Kinematic Viscosity:	No information available
Dynamic Viscosity:	No information available

Other information

Explosive properties	No information available
Oxidizing properties	No information available
Molecular Weight:	144.09

10. Stability and reactivity

Reactivity Releases heat and toxic, irritating vapors when mixed with water. Contact with metals may evolve flammable hydrogen gas. Product in water is a strong acid. It reacts violently with bases and is corrosive.

Chemical stability Stable in HDPE containers. Reacts very slowly with stoneware or glass containers.

Possibility of hazardous reactions Hydrogen fluoride will react with all silicon containing materials such as glass, concrete, and chemical spill sorbents such as vermiculite. This reaction will cause the generation of the highly toxic gas, silicon tetrafluoride. Reacts violently with acetic anhydride, ammonium hydroxide, arsenic trioxide, calcium oxide, potassium permanganate, sodium, sodium hydroxide, sulfuric acid.

Conditions to avoid Exposure to air or moisture over prolonged periods. Extremes of temperature and direct sunlight.

Incompatible Materials Oxidizing agent. Acids. Bases. Metals. Glass. Carbonates. Cyanide compounds. Sulfides. Acid anhydrides. Chlorites. Organic material.

Hazardous decomposition products Thermal decomposition can lead to release of irritating and toxic gases and vapors. Hydrogen fluoride (HF). Silicon dioxide.

11. Toxicological information

Information on likely routes of exposure

Product Information

Inhalation Specific test data for the substance or mixture is not available. Corrosive by inhalation. (based on components). Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal.

Eye contact Specific test data for the substance or mixture is not available. Causes burns. (based on components). Corrosive to the eyes and may cause severe damage including blindness.

Causes serious eye damage. May cause irreversible damage to eyes.

Skin contact Specific test data for the substance or mixture is not available. Toxic in contact with skin. Causes severe burns. (based on components).

Ingestion Specific test data for the substance or mixture is not available. Causes burns. (based on components). Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if swallowed. May be fatal if swallowed and enters airways.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Redness. Burning. May cause blindness. Coughing and/ or wheezing. Hydrofluoric acid is extremely corrosive and can cause very deep and excruciatingly painful burns and tissue loss. Burns are swollen, hot and painful, then develop white or yellowish areas and blistering, with deep ulceration and destruction of tissue, which tends to heal slowly. The severity of the burns and absorption of the acid (with liquefaction necrosis of soft tissue and decalcification and corrosion of the bone) have resulted in permanent scarring, disability and death. Burns from concentrated solutions (greater than 50%) are felt immediately and tissue destruction is readily apparent. Weaker solutions (20 -50%) result in burns that are apparent after several hours. Burns from solutions of less than 20% may take up to 24 hours to become apparent. Weak solutions (less than 7%) penetrate deeply before causing tissue damage and surface involvement may be minimal. Systemic fluoride toxicity has occurred following ingestion. Symptoms such as nausea, vomiting, abdominal pain, reduced heartbeat and blood pressure, shortness of breath have been reported. In some cases, death occurred in less than one hour following ingestion.

Numerical measures of toxicity

Acute Toxicity:

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral) 387.99 mg/kg
ATEmix (dermal) 375.00 mg/kg
ATEmix (inhalation-dust/mist) 3.76 mg/l

Component Information

Chemical name	Oral LD_{50} :	Dermal LD_{50} :	LC_{50} (Lethal Concentration):
Fluorosilicic acid 16961-83-4	= 430 mg/kg (Rat)	-	= 1.11 mg/L (Rat) 1 h
Hydrogen fluoride 7664-39-3	-	-	= 0.79 mg/L (Rat) 1 h
Water 7732-18-5	> 90 mL/kg (Rat)	-	-

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Classification based on data available for ingredients. Causes severe burns.

Serious eye damage/eye irritation Classification based on data available for ingredients. Causes burns. Risk of serious damage to eyes.

Respiratory or skin sensitization No information available.

Germ cell mutagenicity No information available.

Carcinogenicity See section 2 for classified hazards based on component information.

The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical name	ACGIH	IARC	NTP	OSHA
Fluorosilicic acid 16961-83-4	-	Group 3	-	-

IARC (International Agency for Research on Cancer)
Group 3 - Not Classifiable as to Carcinogenicity in Humans

Reproductive toxicity No information available.

STOT - single exposure No information available.

STOT - repeated exposure No information available.

Aspiration hazard No information available.

Other Adverse Effects: No information available.

12. Ecological information

Ecotoxicity The environmental impact of this product has not been fully investigated.

Chemical name	Toxicity to algae	Toxicity to fish	Toxicity to microorganisms	Toxicity to daphnia and other aquatic invertebrates
Fluorosilicic acid 16961-83-4	-	65 mg/L (LC50 96 h static - Poecilia reticulata) 28.7 mg/L (LC50 96 h static - Pimephales promelas)	-	-
Hydrogen fluoride 7664-39-3	-	-	-	270 mg/L (EC50 48 h - Daphnia species)

Persistence and Degradability: No information available.

Bioaccumulation: There is no data for this product.

Component Information

Chemical name	Partition Coefficient:
Hydrogen fluoride 7664-39-3	-1.4

Mobility: No information available.

Other Adverse Effects: No information available.

13. Disposal considerations

Waste treatment methods

Waste from residues/unused products Dispose of in accordance with local, state, and national regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging Do not reuse empty containers.

US EPA Waste Number (product as supplied) D002, U134

Chemical name	RCRA	RCRA - Basis for Listing	RCRA - D Series Wastes	RCRA - U Series Wastes
Hydrogen fluoride 7664-39-3	U134	-	-	U134

14. Transport information

DOT

UN/ID No	UN1778
Proper shipping name	FLUOROSILICIC ACID
Hazard Class	8
Packing Group	II
Description	UN1778, FLUOROSILICIC ACID, 8, PG II

15. Regulatory information

International Inventories

Chemical name	TSCA	AICS	DSL	NDSL	EINECS	ELINCS	ENCS	IECSC	KECL	PICCS
Fluorosilicic acid 16961-83-4	Present ACTIVE	Present	Present	-	Present	-	Present	Present	Present	Present
Hydrogen fluoride 7664-39-3	Present ACTIVE	Present	Present	-	Present	-	Present	Present	Present	Present
Water 7732-18-5	Present ACTIVE	Present	Present	-	Present	-	Present	Present	Present	Present

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
AICS - Australian Inventory of Chemical Substances
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances

US Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

Chemical name	SARA 313 - Threshold Values %
Hydrogen fluoride 7664-39-3	1.0

SARA 311/312 Hazard Categories
Under the amended regulations at 40 CFR 370, EPCRA 311/312 Tier II reporting for the 2017 and later calendar years will need to be consistent with updated hazard classifications.

CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302).

Chemical name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	SARA Extremely Hazardous Substances TPQ
Hydrogen fluoride 7664-39-3	100 lb	100 lb	100 lb TPQ

Clean Water Act (CWA)
This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Hydrogen fluoride 7664-39-3	100 lb	-	-	X

OSHA - Process Safety Management - Highly Hazardous Chemicals
This product contains one or more substances regulated under Process Safety Management (29 CFR 1910.119).

Chemical name	OSHA - Process Safety Management - Highly Hazardous Chemicals
Hydrogen fluoride 7664-39-3	1000 lb TQ 1000 lb TQ anhydrous

Department of Homeland Security - Chemical Facility Anti-Terrorism Standards (CFATS)
This product contains one or more substances regulated under the Chemical Facility Anti-Terrorism Standards (6 CFR 27).

Chemical name	Department of Homeland Security - Chemical Facility Anti-Terrorism Standards (CFATS)
Hydrogen fluoride 7664-39-3	Release - Toxic concentration >=50% Release - Toxic anhydrous Theft - Weapons of Mass Effect anhydrous

16. Other information

NSF/ANSI 60 Certification

Certified to NSF/ANSI 60

Maximum Use (mg/L unless otherwise indicated): 5

Prepared By: HSE Department
Issue Date: 15-Aug-2014
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Revision Note: Format change. Reviewed and Re-issued.

Disclaimer:
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless

specified in the text.

End of Safety Data Sheet