

SAFETY DATA SHEET

Section 1. Identification

Product Name:	Hexafluorodisilane
Product Type:	Gas
CAS Number:	13830-68-7
Product Number:	SI0687
Product Manufacturer:	Ereztech LLC 11555 Medlock Bridge Road, Suite 100 Johns Creek, GA 30097
Product Information:	(888) 658-1221
<u>In case of an emergency:</u>	CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International); CCN836180 *** Contact manufacturer for all non-emergency calls.

Section 2. Hazards Identification

Hazards Identification

Classification:	GASES UNDER PRESSURE – Compressed Gas, H280 SKIN CORROSION/IRRITATION; - Category 1B, H314 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1, H318 ACUTE TOXICITY, INHALATION; - Category 3, H331 SPECIFIC TARGET ORGAN TOXICITY, SINGLE EXPOSURE; RESPIRATORY TRACT IRRITATION - Category 3, H335
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GHS label elements

Hazard pictograms:



Signal word:	DANGER
Hazard statements:	H280: Contains gas under pressure; may explode if heated. H314: Causes severe skin burns and eye damage. H318: Causes serious eye damage. H331: Toxic if inhaled. H335: May cause respiratory irritation.

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Section 2. Hazards Identification

Precautionary statements

Prevention:

P260: Avoid breathing vapors and gases.
P264: Wash skin thoroughly after handling.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P330 + P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353: If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present. Continue rinsing.
P310: Immediately call a POISON CENTER or doctor/physician.

Storage:

P363: Wash contaminated clothing before reuse.
P405: Store locked up.
P410 + P403 + P233: Protect from sunlight. Store in a well ventilated place. Keep container tightly closed.

Disposal:

P501: Dispose of contents/ container to an approved wasted disposal plant.

OSHA/HCS status:

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Hazards not otherwise classified:

Reacts with water to release hydrogen chloride.

Section 3. Composition/Information on Ingredients

Substances

Formula

: F₆Si₂

Synonyms

: Disilane, 1,1,1,2,2,2-hexafluoro; perfluorosilane; disilicon hexafluoride.

Molecular weight

: 170.16 g/mol

CAS-No.

: 13830-68-7

Ingredient Name	%	CAS Number
Hexafluorodisilane	>98	13830-68-7

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

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Section 4. First Aid Measures

Description of Necessary First Aid Measures

- General Advice:** Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance.
- Eye Contact:** Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue rinsing. Call a physician or POISON CONTROL CENTER immediately.
- Skin Contact:** Take off contaminated clothing and shoes immediately. Wash off contaminated skin with soap and plenty of water. Call a physician or POISON CONTROL CENTER immediately.
- Inhalation:** Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. DO NOT provide mouth-to-mouth resuscitation as it may be dangerous to the provider. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Call a POISON CENTER or doctor/physician immediately.
- Ingestion:** Rinse mouth. Do NOT induce vomiting. Remove dentures if any. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Call a physician or POISON CONTROL CENTER immediately.

Most Important Symptoms/Effects, Acute And Delayed Potential Acute Health Effects

- Eye Contact:** Severe chemical burns to the eye may be expected and may cause permanent eye damage. Symptoms may include itching, burning, pain, redness and temporary/permanent loss of vision.
- Inhalation:** Toxic if inhaled; may be fatal if inhaled. Inhalation of product may be expected to cause severe chemical burns of mucous membranes. Symptoms may include throat irritation, coughing, choking sensation, bronchospasm, laryngospasm, chest pain, permanent lung damage and pulmonary edema.
- Skin Contact:** Skin contact with this product may be expected to cause severe chemical burns. Skin burns may result in absorption of potentially harmful amounts of material. Initial symptoms may include stinging, itching, pain (may be delayed), redness and tissue necrosis.
- Ingestion:** Ingestion will result in burns of the mouth, throat, esophagus and digestive tract. Symptoms may include burning, pain, nausea and vomiting.

Indication of Immediate Medical Attention and Special Treatment Needed, If Necessary

- Notes to Physician:** Product reacts with water and human tissues to form hydrofluoric acid.

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Section 4. First Aid Measures

Specific Treatments:	Massage a paste of 20% magnesium oxide in glycerol onto the burned areas. Inject 2-5 cc of 10% calcium gluconate beneath and around the burned areas. If swallowed, gastric lavage using 5% calcium chloride followed by saline catharsis.
Protection of First Responders:	No action taken shall be taken involving any personal risk without suitable training. DO NOT provide mouth-to-mouth resuscitation as it may be dangerous to the provider.

See toxicological information (Section 11)

Section 5. Fire Fighting Measures

Suitable Extinguishing Media:	THE MOST EFFECTIVE FIRE EXTINGUISHING AGENT IS DRY CHEMICAL POWDER PRESSURIZED WITH NITROGEN. Vermiculite, sand, dry chemical or carbon dioxide (CO ₂) may also be used. Water spray may be used to cool sealed containers.
Unsuitable Extinguishing Media:	Do not use water (fog, spray or jet). Product reacts with moist air/water to release irritating fumes, hydrogen fluoride and hydrofluoric acid vapors.
Fire and Explosion Hazards:	Contains gas under pressure which may explode if heated.
Products of Combustion:	Hexafluorodisilane is not combustible. Products released under fire conditions include hydrogen fluoride and silicon oxides.
Protection of Firefighters:	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Fire-fighters should wear appropriate protection equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in a positive pressure mode.

Section 6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

For Non-emergency Personnel:	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Avoid all contact with released product. Avoid inhalation of sprays, vapors, gases, aerosols or mists. Provide adequate ventilation.
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Section 6. Accidental Release Measures

For Non-emergency Personnel:
(cont.)

Wear respiratory protection. Put on appropriate personal protective equipment.

For Emergency Responders:

If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For nonemergency personnel".

Environmental Precautions:

Do not allow dispersal of spilled material and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for Containment

Small Spill:

If safe to do so, stop or reduce leak. Approach release from upwind. Product has a vapor density which is greater than air. Prevent entry into sewers, water courses, basements or confined areas. Released material will react with moisture in the air to form hydrogen fluoride and hydrofluoric acid fumes. Ventilate the area to prevent the gas from accumulating, especially in confined spaces.

Small/Large Spill:

If safe to do so, stop or reduce the leak. Approach release from upwind. Product has a vapor density which is greater than air. Prevent entry into sewers, water courses, basements or confined areas. Released material will react with moisture in the air to form hydrogen fluoride and hydrofluoric acid fumes. Ventilate the area to prevent the gas from accumulating, especially in confined spaces. If possible, turn leaking container so that gas escapes rather than liquefied gas. Knock down gas with fog or fine water spray. Do not direct water at spill or source.

Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and Storage

Precautions:

Avoid contact with skin, eyes and clothing. Avoid inhalation of aerosols, vapors or mists. Do not ingest. Provide adequate ventilation.

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Section 7. Handling and Storage

Protective Measures:

Put on appropriate personal protective equipment (see Section 8). Keep in the original container kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

General Occupational Hygiene:

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Safe Storage Conditions:

Keep away from air and moisture. Store in original container protected from direct sunlight in a dry and well-ventilated area, away from incompatible materials noted above and food and drink. Keep container tightly closed and sealed until ready for use. Store locked up.

Section 8. Exposure Controls/Personal Protection

Introductory Remarks:

These recommendations provide general guidance for handling this product. Because work environments and material handling practices vary, safety procedures should be developed for each intended application. While developing safe handling procedures, do not overlook the need to clean equipment and conduct regular repairs. Waste from these procedures should be handled in accordance with Section 13.

Occupational Exposure Limits

List	Components	CAS-No.	Type	Value
OSHA	Hexafluorodisilane	13830-68-7	PEL	3 ppm (HF) - TWA

Engineering Controls:

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute. Provide an eyewash/shower station.

Environmental Exposure Controls:

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

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Section 8. Exposure Controls/Personal Protection

Individual Protection Measures

Hygiene Measures:

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Remove all soiled and contaminated clothing immediately. Do not inhale aerosols, gases, vapors, sprays or mists. Avoid contact with eyes and skin. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/Face Protection:

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or aerosols. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles, faceshield (8-inch minimum). Refer to 29 CFR 1910.133, ANSI Z87.1, or European Standard EN166.

Skin Protection

Hand Protection:

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: Chemical-resistant 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. Wash and dry hands. For full contact, use Neoprene or nitrile rubber.

Other Skin Protection:

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

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Section 8. Exposure Controls/Personal Protection

Respiratory Protection:

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Section 9. Physical and Chemical Properties

Physical State:	Gas.
Color:	Colorless, fumes in moist air.
Odor:	Pungent, suffocating.
pH:	No data available.
Freezing Point:	-18.5 °C (-1.3 °F).
Boiling Point:	-19 °C (-2.2 °F).
Flash Point:	Not flammable.
Auto-ignition temperature:	Not combustible.
Relative Density:	1.282 g/ml (liquid), 7.75 g/L (gas).
Vapor Pressure:	~ 4 atm @ 25 °C.
Vapor Density:	>3 (Air = 1).
Water Solubility:	Reacts vigorously with water to liberate hydrogen fluoride.
Viscosity:	No data available.
Volatile %:	No data available.

Section 10. Stability and Reactivity

Reactivity:	This product reacts with air, water and compounds containing active hydrogen such as alcohols and acids to release hydrogen fluoride.
Chemical Stability:	This product is stable when stored at room temperature, under a dry, inert atmosphere and away from heat. Nitrogen containing less than 5 ppm each moisture and air is recommended. This product is not sensitive to impact. Product is unstable above 73 °C.
Conditions to Avoid:	Keep away from air, moisture, heat, open flames, sparks.

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Section 10. Stability and Reactivity

Incompatible Materials:	Air, water and compounds containing active hydrogen such as alcohols and acids.
Hazardous Decomposition Products:	Under normal conditions of storage and use, hazardous decomposition products should not be produced. Hazardous decomposition products formed under fire conditions: hydrogen fluoride and silicon oxide fumes. In the event of a fire: see section 5.
Possibility of Hazardous Reactions:	Under normal conditions of storage and use noted above, hazardous reactions will not occur.

Section 11. Toxicological Information

Information on Toxicological Effects

Acute Toxicity	: ATE US (gases) – 2272 ppm V/4h.
Irritation/Corrosion	: No specific data available. Product may be expected to cause chemical burns to the skin, eyes and exposed mucous membranes.
Sensitization	: No specific data available.
Germ Cell Mutagenicity	: No effects known.
Carcinogenicity	
IARC	: No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH	: No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by ACGIH.
NTP	: No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by NTP.
OSHA	: No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by OSHA.
Reproductive Toxicity	: This product is not expected to cause reproductive or developmental effects.
Teratogenicity	: No specific data available.
Specific Target Organ Toxicity (single exposure)	: Respiratory tract irritation/damage through chemical burns. May be fatal if inhaled.
Specific Target Organ Toxicity (repeated exposure)	: No specific data available.

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Section 11. Toxicological Information

- Aspiration Hazard** : No specific data available.
- Information on the likely routes of exposure** : No specific data available.
- Additional Information** : Hydrofluoric acid, which results from the hydrolysis of this product, has demonstrated mutagenicity and teratogenicity in laboratory bioassay.
- To the best of our knowledge, the chemical, physical and toxicological properties of this product have not been thoroughly investigated.

Section 12. Ecological Information

Numerical Measures of Toxicity

- Toxicity to Fish** : No specific data available.
- Toxicity to daphnia and other aquatic invertebrates** : No specific data available.
- Toxicity to algae** : No specific data available.
- Persistence and Degradability**
- Biodegradability** : No specific data available.
- Bioaccumulative potential** : No specific data available.
- Mobility in soil** : No specific data available.
- Other Adverse Effects** : This product may be hazardous to the environment. An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Section 13. Disposal Considerations

Waste Treatment Methods

- Product** Dispose of in accordance with local, state, and federal regulations. Refer to 40 CFR 260-299 for complete waste disposal regulations. Consult your local, state, or federal agency before disposing of any chemicals.
- Contaminated packaging** Empty containers retain product residue (aerosols, vapors, gases) and can be dangerous. DO NOT EXPOSE SUCH CONTAINERS TO AIR, MOISTURE, HEAT, FLAME, OR SPARKS AS THE RESULTING CHEMICAL REACTIONS MAY CAUSE INJURY OR DEATH.

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Section 14. Transport Information

	DOT	IMDG	IATA
UN Number	UN 3308	UN 3308	UN 3308
UN Proper Shipping Name	Liquefied gas, toxic, corrosive, n.o.s. (Hexafluorodisilane)	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S. (Hexafluorodisilane)	Liquefied gas, toxic, corrosive, n.o.s. (Hexafluorodisilane)
Transport Hazard Classes	2.3 (8)	2.3 (8)	2.3 (8)
Packing Group	N/A (gas)	N/A (gas)	N/A (gas)
Environmental Hazards	-	-	-
Additional Information	-	EMS-No: F-C, S-U	Transport Forbidden

Special Precautions for User : Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transporting in Bulk According to Annex II of MARPOL 73/78 and the IBC Code : Not applicable.

Section 15. Regulatory Information

TSCA (Toxic Substance Control Act):

This product is not listed on the U.S. Toxic Substances Control Act Chemical Inventory (TSCA Inventory). Use of this product is restricted to research and development only. This product must be used under the supervision of a technically qualified individual as defined by the TSCA. This product must not be used for commercial purposes or in formulations for commercial purposes.

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Acute Health Hazard (Acute Toxicity (Inhalation); Skin Corrosion; Serious Eye Damage; STOT (single) – Respiratory).

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Section 15. Regulatory Information

Massachusetts Right to Know Components

Compound

Hydrogen fluoride (hydrofluoric acid)

CAS-No.

7664-39-3

Revision Date

-

Pennsylvania Right to Know Components

Compound

Hydrogen fluoride (hydrofluoric acid)

CAS-No.

7664-39-3

Revision Date

-

New Jersey Right to Know Components

Compound

Hydrogen fluoride (hydrofluoric acid)

CAS-No.

7664-39-3

Revision Date

-

California Proposition 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Section 16. Other Information

National Fire Protection Association (U.S.A.)



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

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Section 16. Other Information

HMIS Rating

HEALTH	4
FLAMMABILITY	0
PHYSICAL HAZARD	2

History

Date of printing	: 1/4/2020
Date of issue/Date of Revision	: 1/4/2020
Date of previous issue	: 11/13/19
References	: None available

Abbreviations and Acronyms

ACGIH: American Conference of Governmental Industrial Hygienists.

ATE: Acute Toxicity Estimate

CAS: Chemical Abstracts Service (division of the American Chemical Society).

DOT: US Department of Transportation.

GHS: Globally Harmonized System of Classification and Labeling of Chemicals.

HMIS: Hazardous Materials Identification System.

IARC: International Agency for Research on Cancer.

IATA: International Air Transport Association.

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA).

IDLH: Immediately Dangerous to Life or Health (US National Institute for Occupation Health and Safety (NIOSH)).

IMDG: International Maritime Code for Dangerous Goods.

NFPA: National Fire Protection Association.

NIOSH: National Institute of Occupational Safety and Health.

NTP: National Toxicology Program.

OSHA: Occupational Safety and Health Administration.

PEL: Permissible Exposure Limits.

REL: Recommended Exposure Limits.

SARA: Superfund Amendments and Reauthorization Act.

STOT: Specific Target Organ Toxicity.

TLV: Threshold Limit Values (ACGIH).

TWA: Time Weighted Average.

VOC: Volatile Organic Compound.

Disclaimer

The information herein is believed to be accurate and is presented in good faith; however, no warranties or representations are made by Ereztech LLC regarding the accuracy or completeness of the information. Ereztech LLC shall not be liable for any damages resulting from the handling, or from the contact with the above product.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.