

# Safety Data Sheet

Version 4.0  
Revision Date 12/08/2016

SDS Number 300000000078  
Print Date 12/16/2017

## 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Hydrogen fluoride

Chemical formula : HF

Synonyms : Hydrogen fluoride, Anhydrous Hydrofluoric Acid, Anhydrous Hydrogen Fluoride

Product Use Description : General Industrial

Manufacturer/Importer/Distributor : Air Products and Chemicals, Inc  
7201 Hamilton Blvd.  
Allentown, PA 18195-1501  
GST No. 123600835 RT0001  
QST No. 102753981 TQ0001

Telephone : 1-610-481-4911 Corporate  
1-800-345-3148 Chemicals Cust Serv  
1-800-752-1597 Gases/Electronics Cust Serv

Emergency telephone number (24h) : 800-523-9374 USA  
+1 610 481 7711 International

## 2. HAZARDS IDENTIFICATION

### GHS classification

Gases under pressure - Liquefied gas.  
Acute toxicity - Oral Category 1  
Acute toxicity - Inhalation Category 3  
Acute toxicity - Dermal Category 1  
Skin corrosion - Category 1A

### GHS label elements

#### Hazard pictograms/symbols



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Signal Word: Danger

## Hazard Statements:

H280:Contains gas under pressure; may explode if heated.

H300+H310:Fatal if swallowed or in contact with skin

H314:Causes severe skin burns and eye damage.

H331:Toxic if inhaled.

EUH071:Corrosive to the respiratory tract.

Symptoms may be delayed.

## Precautionary Statements:

- Prevention : P261:Avoid breathing dust/fume/gas/mist/vapours/spray.  
P262:Do not get in eyes, on skin, or on clothing.  
P264:Wash hands thoroughly after handling.  
P270:Do not eat, drink or smoke when using this product.  
P271:Use only outdoors or in a well-ventilated area  
P280:Wear protective gloves/protective clothing/eye protection/face protection.
- Response : P301+P310 :IF SWALLOWED: Immediately call a POISON CENTER/doctor.  
P301+P330+P331 :IF SWALLOWED: rinse mouth. Do NOT induce vomiting.  
P303+P361+P353 :IF ON SKIN (or hair): Remove/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 and easy to do. Continue rinsing.  
P310 :Immediately call a POISON CENTRE/doctor.  
P363 :Wash contaminated clothing before reuse.
- Storage : P403+P233:Store in a well-ventilated place. Keep container tightly closed.  
P405:Store locked up.  
P410+P403:Protect from sunlight. Store in a well-ventilated place.
- Disposal : P501:Disposal of contents/container to be specified in accordance with regulations.

## Hazards not otherwise classified

Symptoms may be delayed.  
Can cause severe burns if inhaled or upon skin contact.  
Requires specialized medical treatment procedures.  
Wear self-contained breathing apparatus and protective suit.  
Direct contact with liquid can cause frostbite.  
May react violently with water.  
Do not breathe gas.  
Corrosive to eyes, respiratory system and skin.  
Compressed liquefied gas.

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## 3. COMPOSITION/INFORMATION ON INGREDIENTS

| Components        | CAS Number | Concentration (Volume) |
|-------------------|------------|------------------------|
| Hydrogen fluoride | 7664-39-3  | 100 %                  |

Concentration is nominal. For the exact product composition, please refer to technical specifications.

## 4. FIRST AID MEASURES

- General advice** : If additional information is needed consult the Safetygram – “Medical treatment Protocol for Hydrofluoric Acid Burns” available on the company website. Prompt medical attention is required in all cases of exposure. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped. Use chemically protective clothing.
- Eye contact** : Seek medical treatment immediately. Irrigate eye intermittently for 20 minutes with an aqueous calcium gluconate 1% solution, if available. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
Keep eye wide open while rinsing.
- Skin contact** : A physician should be consulted for all exposures . Burns covering an area greater than 25 square centimeters (4 square inches) require immediate treatment by a medical doctor. Immediately go to a safety shower or other available water and flush with copious amounts of water for a minimum of 5 minutes. This will rinse off excess HF. Speed and thoroughness in washing off the acid is of primary importance, since after 5 minutes the HF is being absorbed into the tissue. Remove contaminated clothing. With gloved hand apply 2.5% calcium gluconate gel to the burn area. Alternative treatment is to soak the affected areas in an iced 0.13% water solution (1:750) of Zephiran® chloride (benzalkonium chloride solution, NF). Use ice cubes, not shaved ice, to prevent frostbite. If soaking is impractical, soaks or compresses may be used. (Do not use Zephiran® for burns of the eye.) If immersion is impractical, soaked compresses of the same solution should be applied to the area. Immersion or compresses must be used continuously for two hours. Flush with copious amounts of water until treatment is available. Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and badly.
- Ingestion** : Drink 1 to 3 glasses of water or milk. Do not induce vomiting. Call a physician immediately. Never give anything by mouth to an unconscious person. Gastric lavage with calcium chloride or calcium gluconate may be performed by a physician. Administer several vials of 10% aqueous calcium gluconate orally. (Calcium carbonate or an antacid containing calcium carbonate or magnesium carbonate or hydroxide may also be used.)
- Inhalation** : As soon as possible give 2.5% to 3% calcium gluconate solution by nebulizer. Move to fresh air. If breathing has stopped or is labored, give assisted

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respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. Mouth to mouth resuscitation is not recommended. Use a barrier device. If unconscious place in recovery position and seek medical advice. In case of shortness of breath, give oxygen. Consult a doctor.

Most important symptoms/effects - acute and delayed : Acute or chronic respiratory conditions.

## Immediate Medical Attention and Special Treatment

Treatment : This advice is provided to the attending physician because of the specific properties of hydrogen fluoride and hydrofluoric acid. All cases of ingestion and airway exposure, and skin burns with hydrofluoric acid >20% should be regarded as potentially fatal. Patients who have burns and pain within minutes of exposure can be assumed to have been exposed to concentrated acid and are at risk of rapid clinical deterioration and death. Burns can be accompanied by absorption of fluoride through the skin with sequestration of circulating calcium leading to hypocalcemia and hyperkalemia from the release of cell contents. Fatal cardiac dysrhythmias may ensue. A person who has HF burns greater than 25 square inches or who has been burned with concentrated HF should be admitted immediately to an intensive care unit and carefully monitored by EKG for 24 to 48 hours. Blood sampling should be taken to monitor circulating fluoride, potassium and calcium levels. Hemodialysis may be necessary for fluoride removal and correction of hyperkalemia. HF inhaled in high concentrations may cause acute inflammation and edema of the airway and acute pulmonary edema. Anyone who has been exposed to HF gas or mists and experiences respiratory irritation should be admitted to and monitored in an intensive care unit. In some cases, if the eyes are exposed to HF, it may penetrate to internal structures resulting in irreversible damage. HF skin burns are usually accompanied by severe, throbbing pain, which is thought to be due to irritation of nerve endings by increased levels of potassium ions entering the extracellular space to compensate for the reduced levels of calcium ions, which have been bound to the fluoride. Do NOT use local anesthetic or analgesic. RELIEF OF PAIN IS AN IMPORTANT GUIDE TO THE SUCCESS OF TREATMENT. If exposed or concerned: Get medical attention/advice.

## 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : All known extinguishing media can be used.

Specific hazards : Product is nonflammable and does not support combustion. Upon exposure to intense heat or flame, cylinder will vent rapidly and or rupture violently. Product is nonflammable and does not support combustion. Use of water may result in the formation of very toxic aqueous solutions. Move away from container and cool with water from a protected position. Do not allow run-off from fire fighting to enter drains or water courses. Keep containers and surroundings cool with water spray. If possible, stop flow of product. Most cylinders are designed to vent contents when exposed to elevated temperatures.

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Special protective equipment for fire-fighters : Use self-contained breathing apparatus and chemically protective clothing.

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## 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures : Use chemically protective clothing. Evacuate personnel to safe areas. Ventilate the area. Approach suspected leak areas with caution. Use self-contained breathing apparatus or positive pressure air line with mask and escape pack in areas where concentration is unknown or above the exposure limits.

Environmental precautions : Should not be released into the environment. Prevent further leakage or spillage if safe to do so. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

Methods for cleaning up : Ventilate the area. Wash contaminated equipment or sites of leaks with copious quantities of water. Reduce vapor with fog or fine water spray.

Additional advice : Reduce vapor with fog or fine water spray. Large releases may require considerable downwind evacuation. If possible, stop flow of product. Increase ventilation to the release area and monitor concentrations. If leak is from cylinder or cylinder valve, call the emergency telephone number. If the leak is in the user's system, close the cylinder valve, safely vent the pressure, and purge with an inert gas before attempting repairs.

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## 7. HANDLING AND STORAGE

### Handling

Inexperienced or first time users of product should contact supplier for additional information on the storage, handling and use of this product. Systems that contain moisture may form hydrofluoric acid. Carbon steel, stainless steel, Monel or copper are suitable materials of construction when no moisture is present. Hastelloy, platinum or gold offer good resistance to corrosion when moisture is present. Use equipment rated for cylinder pressure. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling or being knocked over. Protect cylinders from physical damage; do not drag, roll, slide or drop. Do not allow storage area temperature to exceed 50°C (122°F). Only experienced and properly instructed persons should handle compressed gases/cryogenic liquids. Before using the product, determine its identity by reading the label. Know and understand the properties and hazards of the product before use. When doubt exists as to the correct handling procedure for a particular gas, contact the supplier. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Use an adjustable strap wrench to remove over-tight or rusted caps. Before connecting the container, check the complete gas system for suitability, particularly for pressure rating and materials. Before connecting the container for use, ensure that back feed from the system into the container is prevented. Ensure the complete gas system is compatible for pressure rating and materials of construction. Ensure the complete gas system has been checked for leaks before use. Employ suitable pressure regulating devices on all containers when the gas is being emitted to systems with lower pressure rating than that of the container. Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur. Open valve slowly. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Damaged

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valves should be reported immediately to the supplier. Close valve after each use and when empty. Replace outlet caps or plugs and container caps as soon as container is disconnected from equipment. Do not subject containers to abnormal mechanical shock. Never attempt to lift a cylinder by its valve protection cap or guard. Do not use containers as rollers or supports or for any other purpose than to contain the gas as supplied. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit. Keep container valve outlets clean and free from contaminants particularly oil and water. Do not smoke while handling product or cylinders. Never re-compress a gas or a gas mixture without first consulting the supplier. Never attempt to transfer gases from one cylinder/container to another. Always use backflow protective device in piping. Purge air from system before introducing gas. Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service. Avoid suckback of water, acid and alkalis. Installation of a cross purge assembly between the cylinder and the regulator is recommended. When returning cylinder install valve outlet cap or plug leak tight. Never use direct flame or electrical heating devices to raise the pressure of a container. Containers should not be subjected to temperatures above 50°C (122°F). Never attempt to increase liquid withdrawal rate by pressurizing the container without first checking with the supplier. Never permit liquefied gas to become trapped in parts of the system as this may result in hydraulic rupture.

## Storage

CAUTION: There is a potential over-pressure hazard with the long term storage of carbon steel cylinders containing anhydrous Hydrogen Fluoride (AHF). AHF in the cylinder reacts very slowly with the iron in the steel to form iron fluoride and hydrogen. The hydrogen collects in the vapor space and builds pressure. Carbon steel cylinders containing AHF should not be stored for extended periods of time without monitoring pressure and cylinder condition. Extreme caution should be taken during the handling of any AHF cylinders that have been stored for extended periods of time. Air Products recommends a pressure check be conducted every two years for continued storage of unused product. Excess pressure must be vented through an appropriate scrubber system. If user wishes to return cylinder after two years, please contact your supplier for return. This cylinder must be returned before the date affixed to its shoulder in order to be submitted to the periodic inspection required by ADR. Open/close valve slowly. Close when not in use. Wear Safety Eye Protection. Check Safety Data Sheet before use. Use a back flow preventative device in the piping. Use only with equipment of compatible materials of construction, rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Full containers should be stored so that oldest stock is used first. Containers should be stored in a purpose build compound which should be well ventilated, preferably in the open air. Observe all regulations and local requirements regarding storage of containers. Stored containers should be periodically checked for general condition and leakage. Local codes may have special requirements for toxic gas storage. Protect containers stored in the open against rusting and extremes of weather. Containers should not be stored in conditions likely to encourage corrosion. Containers should be stored in the vertical position and properly secured to prevent toppling. The container valves should be tightly closed and where appropriate valve outlets should be capped or plugged. Container valve guards or caps should be in place. Keep containers tightly closed in a cool, well-ventilated place. Full and empty cylinders should be segregated. Do not allow storage temperature to exceed 50°C (122°F). Return empty containers in a timely manner.

## Technical measures/Precautions

Provide sufficient air exchange and/or exhaust in work rooms. Containers should be segregated in the storage area according to the various categories (e.g. flammable, toxic, etc.) and in accordance with local regulations.

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## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Engineering measures

Handle product only in closed system or provide appropriate exhaust ventilation at machinery.  
Provide natural or explosion-proof ventilation adequate to ensure concentrations are kept below exposure limits.

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Provide readily accessible eye wash stations and safety showers.

## Personal protective equipment

- Respiratory protection : Keep self contained breathing apparatus readily available for emergency use. Use self-contained breathing apparatus or positive pressure air line with mask and escape pack in areas where concentration is unknown or above the exposure limits. Users of breathing apparatus must be trained.
- Hand protection : Wear neoprene, polyvinyl chloride [PVC], nitrile, or other acid resistant gloves to prevent contact with hydrofluoric acid. Wearing a thin inner glove in addition to heavy acid resistant outer glove is recommended. Sturdy work gloves are recommended for handling cylinders. 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.
- Eye protection : Safety glasses recommended when handling cylinders. A full faceshield should be worn in addition to safety glasses when connecting, disconnecting or opening cylinders.
- Skin and body protection : Acid resistant gloves (e.g. butyl rubber, neoprene, polyethylene) and splash suit when connecting, disconnecting or opening cylinders. Safety shoes are recommended when handling cylinders. Encapsulated chemical protective suit in emergency situations.
- Special instructions for protection and hygiene : Keep suitable chemically resistant protective clothing readily available for emergency use. Keep self contained breathing apparatus readily available for emergency use. Ensure adequate ventilation, especially in confined areas. Provide good ventilation and/or local exhaust to prevent accumulation of concentrations above exposure limits.

## Exposure limit(s)

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|                   |   |         |            |
|-------------------|---|---------|------------|
| Hydrogen fluoride | Time Weighted Average (TWA): ACGIH                                      | 0.5 ppm | -          |
| Hydrogen fluoride | Ceiling Limit Value: ACGIH  | 2 ppm   | -          |
| Hydrogen fluoride | Recommended exposure limit (REL): NIOSH                                 | 3 ppm   | 2.5 mg/m3  |
| Hydrogen fluoride | Ceiling Limit Value and Time Period (if specified): NIOSH               | 6 ppm   | 5 mg/m3    |
| Hydrogen fluoride | Time Weighted Average (TWA): OSHA Z2                                    | 3 ppm   | -          |
| Hydrogen fluoride | Time Weighted Average (TWA): OSHA Z1A                                   | 3 ppm   | -          |
| Hydrogen fluoride | Short Term Exposure Limit (STEL): OSHA Z1A                              | 6 ppm   | -          |
| Hydrogen fluoride | Time Weighted Average (TWA) Permissible Exposure Limit (PEL): US CA OEL | 0.4 ppm | 0.33 mg/m3 |
| Hydrogen fluoride | Short Term Exposure Limit (STEL): US CA OEL                             | 1 ppm   | 0.83 mg/m3 |
| Hydrogen fluoride | Permissible exposure limit: OSHA Z1                                     | -       | 2.5 mg/m3  |
| Hydrogen fluoride | Time Weighted Average (TWA): TN OEL                                     | 3 ppm   | -          |
| Hydrogen fluoride | Short Term Exposure Limit (STEL): TN OEL                                | 6 ppm   | -          |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

|  |  |
|--|--|
| Appearance                               | : Liquefied gas. Gives off white fumes in moist air                                    |
| Odor                                     | : Pungent.   |
| Odor                                     | : Mixture contains one or more component(s) which have the following odor:<br>Pungent. |
| Odor threshold                           | : No data available.   |
| pH                                       | : Not applicable.  |
| Melting point/range                      | : -117 °F (-83 °C)   |
| Boiling point/range                      | : 67 °F (19.5 °C)  |
| Flash point                              | : Not applicable.  |
| Evaporation rate                         | : Not applicable.  |
| Flammability (solid, gas)                | : Refer to product classification in Section 2   |
| Upper/lower explosion/flammability limit | : No data available.   |
| Vapor pressure                           | : 14.50 psia (1.00 bara) at 68 °F (20 °C)  |
| Water solubility                         | : Hydrolyses.<br>Reacts violently with water.  |
| Relative vapor density                   | : 0.7 (air = 1)  |

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|   |  |
|---|--|
| Relative density                        | : 0.97 (water = 1)   |
| Partition coefficient (n-octanol/water) | : Not applicable.  |
| Auto-ignition temperature               | : No data available.   |
| Decomposition temperature               | : No data available.   |
| Viscosity                               | : Not applicable.  |
| Molecular Weight                        | : 20 g/mol   |
| Density                                 | : 0.175 lb/ft <sup>3</sup> (0.0028 g/cm <sup>3</sup> ) at 70 °F (21 °C) Note: (as vapor) |
| Specific Volume                         | : 5.65 ft <sup>3</sup> /lb (0.3527 m <sup>3</sup> /kg) at 70 °F (21 °C)                  |

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## 10. STABILITY AND REACTIVITY

|   |   |
|---|---|
| Chemical Stability                            | : Stable under normal conditions.   |
| Conditions to avoid                           | : No data available.  |
| Materials to avoid                            | : Water.<br>Aluminium.<br>Materials made of glass or ceramic.<br>Brass.<br>May react violently with alkalis.<br>Zinc. |
| Hazardous decomposition products              | : Gives off hydrogen by reaction with metals.   |
| Possibility of hazardous Reactions/Reactivity | : No data available.  |

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## 11. TOXICOLOGICAL INFORMATION

### 11.1. Information on toxicological effects

#### Likely routes of exposure

|                    |   |
|--------------------|---|
| Effects on Eye     | : May cause blindness. Irritating to eyes. Causes severe eye burns. May cause permanent eye injury.   |
| Effects on Skin    | : Causes severe burns which may not be immediately painful or visible. Contact with liquid may cause cold burns/frostbite. Causes skin irritation. Causes skin burns. |
| Inhalation Effects | : Irritating to respiratory system. Can cause severe lung damage. May be fatal if inhaled. Delayed adverse effects possible. Prolonged exposure to small              |

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concentrations may result in pulmonary edema. Delayed fatal pulmonary edema possible.

Ingestion Effects : Causes severe digestive tract burns. May be fatal if swallowed.

Symptoms : No data available.

## Acute toxicity

Acute Oral Toxicity : No data is available on the product itself.

Inhalation : LC50 (1 h) : 1276 ppm Species : Rat.

Acute Dermal Toxicity : No data is available on the product itself.

Skin corrosion/irritation : No data available.

Serious eye damage/eye irritation : No data available.

Sensitization. : No data available.

## Chronic toxicity or effects from long term exposures

Carcinogenicity : No data available.

Reproductive toxicity : No data is available on the product itself.

Germ cell mutagenicity : No data is available on the product itself.

Specific target organ systemic toxicity (single exposure) : No data available.

Specific target organ systemic toxicity (repeated exposure) : No data available.

Aspiration hazard : No data available.

## Delayed and Immediate Effects and Chronic Effects from Short and Long Term Exposure

Chronic fluoride exposure may cause bone or joint changes in humans (fluorosis). Acute or chronic respiratory conditions.

Asthma.

Animals exposed to hydrogen fluoride have exhibited kidney, lung, heart and liver damage.

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## 12. ECOLOGICAL INFORMATION

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## Ecotoxicity effects

- Aquatic toxicity : Toxic to aquatic organisms. May cause pH changes in aqueous ecological systems.
- Toxicity to other organisms : No data available.

## Persistence and degradability

- Biodegradability : No data is available on the product itself.
- Mobility : No data available.
- Bioaccumulation : Refer to Section 9 "Partition Coefficient (n-octanol/water)".
- Bioaccumulation - Components  
Hydrogen fluoride : Negligible bioaccumulation potential.

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## 13. DISPOSAL CONSIDERATIONS

- Waste from residues / unused products : Do not attempt to dispose of residual or unused quantities. Small quantities may be disposed by slowly flowing gas in to a caustic liquid or solid scrubber. Soda lime, a sodium hydroxide-calcium oxide mixture, or calcium carbonate are suitable solid scrubber media. In accordance with local and national regulations. Return unused product in original cylinder to supplier. Contact supplier if guidance is required. Must not be discharged to atmosphere.
- Contaminated packaging : Return cylinder to supplier.

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## 14. TRANSPORT INFORMATION

### DOT

- UN/ID No. : UN1052
- Proper shipping name : Hydrogen fluoride, anhydrous
- Class or Division : 8
- Packing group : I
- Label(s) : 8 (6.1)
- PIH Zone : C
- RQ Substance : Yes
- Marine Pollutant : No

\* NOTE: This product contains a USDOT Hazardous Substance and will meet the Reportable Quantity definition when shipped to, from, or within the United States, in the amount specified in 49CFR 172.101 Appendix A.

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## IATA

Transport Forbidden

## IMDG

UN/ID No. : UN1052  
Proper shipping name : HYDROGEN FLUORIDE, ANHYDROUS  
Class or Division : 8  
Packing group : I  
Label(s) : 8 (6.1)  
RQ Substance : Yes  
Marine Pollutant : No

\* NOTE: This product contains a USDOT Hazardous Substance and will meet the Reportable Quantity definition when shipped to, from, or within the United States, in the amount specified in 49CFR 172.101 Appendix A.

## TDG

UN/ID No. : UN1052  
Proper shipping name : HYDROGEN FLUORIDE, ANHYDROUS  
Class or Division : 8  
Packing group : I  
Label(s) : 8 (6.1)  
RQ Substance : Yes  
Marine Pollutant : No

\* NOTE: This product contains a USDOT Hazardous Substance and will meet the Reportable Quantity definition when shipped to, from, or within the United States, in the amount specified in 49CFR 172.101 Appendix A.

## Further Information

Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact customer service.

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## 15. REGULATORY INFORMATION

Toxic Substance Control Act (TSCA) 12(b) Component(s):

None.

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| Country     | Regulatory list | Notification           |
|-------------|-----------------|------------------------|
| USA         | TSCA            | Included on Inventory. |
| EU          | EINECS          | Included on Inventory. |
| Canada      | DSL             | Included on Inventory. |
| Australia   | AICS            | Included on Inventory. |
| Japan       | ENCS            | Included on Inventory. |
| South Korea | ECL             | Included on Inventory. |
| China       | SEPA            | Included on Inventory. |
| Philippines | PICCS           | Included on Inventory. |

EPA SARA Title III Section 312 (40 CFR 370) Hazard Classification  
Acute Health Hazard

EPA SARA Title III Section 313 (40 CFR 372) Component(s) above 'de minimus' level  
Hydrogen fluoride

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)  
This product does not contain any chemicals known to State of California to cause cancer, birth defects or any other harm.

## 16. OTHER INFORMATION

### NFPA Rating

Health : 4  
Fire : 0  
Instability : 1

### HMIS Rating

Health : 3  
Flammability : 0  
Physical hazard : 2

Prepared by : Air Products and Chemicals, Inc. Global EH&S Department

Telephone : 1-610-481-4911 Corporate  
1-800-345-3148 Chemicals Cust Serv  
1-800-752-1597 Gases/Electronics Cust Serv

Preparation Date : 12/16/2017

For additional information, please visit our Product Stewardship web site at  
<http://www.airproducts.com/productstewardship/>