1. Identification

<table>
<thead>
<tr>
<th>Product Name</th>
<th>HYDROFLUORIC ACID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat No.</td>
<td>A463-1; A463-2; A463-250; A463-500</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Hydrofluoric acid solution; Fluohydric acid; Fluoric acid</td>
</tr>
<tr>
<td>Recommended Use</td>
<td>Laboratory chemicals</td>
</tr>
<tr>
<td>Uses advised against</td>
<td>Not for food, drug, pesticide or biocidal product use</td>
</tr>
</tbody>
</table>

2. Hazard(s) identification

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

<table>
<thead>
<tr>
<th>Hazard Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrosive to metals</td>
</tr>
<tr>
<td>Acute oral toxicity</td>
</tr>
<tr>
<td>Acute dermal toxicity</td>
</tr>
<tr>
<td>Acute Inhalation Toxicity - Vapors</td>
</tr>
<tr>
<td>Skin Corrosion/irritation</td>
</tr>
<tr>
<td>Serious Eye Damage/Eye Irritation</td>
</tr>
<tr>
<td>Specific target organ toxicity (single exposure)</td>
</tr>
<tr>
<td>Target Organs - Respiratory system.</td>
</tr>
</tbody>
</table>

**Label Elements**

**Signal Word**
Danger

**Hazard Statements**
May be corrosive to metals
Fatal if swallowed
Fatal in contact with skin
Causes severe skin burns and eye damage
May cause respiratory irritation
Fatal if inhaled
Precautionary Statements

Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Do not get in eyes, on skin, or on clothing
Wear protective gloves/protective clothing/eye protection/face protection
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Wear respiratory protection
Keep only in original container

Response
Immediately call a POISON CENTER or doctor/physician

Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

Skin
Wash contaminated clothing before reuse
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower

Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

Ingestion
Rinse mouth
Do NOT induce vomiting

Spills
Absorb spillage to prevent material damage

Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Store in corrosive resistant polypropylene container with a resistant inliner
Store in a dry place

Disposal
Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)
None identified

3. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen fluoride</td>
<td>7664-39-3</td>
<td>40-60</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>40-60</td>
</tr>
</tbody>
</table>

4. First-aid measures

General Advice
Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.

Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Skin Contact  Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.

Inhalation  If not breathing, give artificial respiration. 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. Move to fresh air. Immediate medical attention is required.

Ingestion  Do not induce vomiting. Call a physician or Poison Control Center immediately.

Most important symptoms/effects  Causes burns by all exposure routes. Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation.

Notes to Physician  Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media  Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable Extinguishing Media  No information available

Flash Point  No information available

Method -  No information available

Autoignition Temperature  No information available

Explosion Limits

Upper  No data available

Lower  No data available

Sensitivity to Mechanical Impact  No information available

Sensitivity to Static Discharge  No information available

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.

Hazardous Combustion Products

Gaseous hydrogen fluoride (HF)

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

NFPA

<table>
<thead>
<tr>
<th></th>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
<th>Physical hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>N/A</td>
</tr>
</tbody>
</table>

6. Accidental release measures

Personal Precautions  Use personal protective equipment. Ensure adequate ventilation. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

Environmental Precautions  Should not be released into the environment.

Methods for Containment and Clean Up  Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling  Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Use only under a chemical fume hood. Do not breathe vapors or spray mist. Do not ingest.

Storage  Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area. Do not store in metal containers.
8. Exposure controls / personal protection

Exposure Guidelines

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
<th>Mexico OEL (TWA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen fluoride</td>
<td>TWA: 0.5 ppm TWA: 2.5 mg/m³ Ceiling: 2 ppm Skin</td>
<td>(Vacated) TWA: 3 ppm (Vacated) STEL: 6 ppm TWA: 3 ppm</td>
<td>IDLH: 30 ppm TWA: 3 ppm TWA: 2.5 mg/m³ Ceiling: 6 ppm Ceiling: 5 mg/m³</td>
<td>TWA: 2.5 mg/m³ Ceiling: 3 ppm Ceiling: 2.5 mg/m³</td>
</tr>
</tbody>
</table>

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures

Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

- **Eye/face Protection**: Tightly fitting safety goggles. Face-shield.
- **Skin and body protection**: Long sleeved clothing.
- **Respiratory Protection**: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>pungent</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>&lt; 1.0</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>-35 °C / -31 °F</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>105 °C / 221 °F</td>
</tr>
<tr>
<td>Flash Point</td>
<td>No information available</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>No information available</td>
</tr>
<tr>
<td>Flammability (solid,gas)</td>
<td>No applicable</td>
</tr>
<tr>
<td>Flammability or explosive limits Upper</td>
<td>No data available</td>
</tr>
<tr>
<td>Lower</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>No information available</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>2.21</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.15-1.20</td>
</tr>
<tr>
<td>Solubility</td>
<td>miscible</td>
</tr>
<tr>
<td>Partition coefficient; n-octanol/water</td>
<td>No data available</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>No information available</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>No information available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No information available</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>HF</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>20</td>
</tr>
</tbody>
</table>
**10. Stability and reactivity**

**Reactive Hazard**
None known, based on information available.

**Stability**
Stable under normal conditions.

**Conditions to Avoid**
Incompatible products. Excess heat.

**Incompatible Materials**
Metals, Cyanides, Sulfides, Bases, Fluorine.

**Hazardous Decomposition Products**
Gaseous hydrogen fluoride (HF).

**Hazardous Polymerization**
Hazardous polymerization does not occur.

**Hazardous Reactions**
Corrosive to metals. Contact with metals may evolve flammable hydrogen gas.

**11. Toxicological information**

**Acute Toxicity**

**Product Information**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral LD50</td>
<td>Category 2. ATE = 5 - 50 mg/kg.</td>
</tr>
<tr>
<td>Dermal LD50</td>
<td>Category 1. ATE &lt; 50 mg/kg.</td>
</tr>
<tr>
<td>Vapor LC50</td>
<td>Category 2. ATE = 0.5 - 2 mg/l.</td>
</tr>
</tbody>
</table>

**Component Information**

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen fluoride</td>
<td>Not listed</td>
<td>Not listed</td>
<td>LC50 = 0.79 mg/L (Rat) 1 h</td>
</tr>
<tr>
<td>Water</td>
<td>-</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

**Toxicologically Synergistic Products**
No information available.

**Irritation**
Causes severe burns by all exposure routes.

**Sensitization**
No information available.

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

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>IARC</th>
<th>NTP</th>
<th>ACGIH</th>
<th>OSHA</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen fluoride</td>
<td>7664-39-3</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

**Mutagenic Effects**
No information available.

**Reproductive Effects**
No information available.

**Developmental Effects**
No information available.

**Teratogenicity**
No information available.

**STOT - single exposure**
Respiratory system.

**STOT - repeated exposure**
None known.

**Aspiration hazard**
No information available.

**Symptoms / effects, both acute and delayed**
Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation.

**Endocrine Disruptor Information**
No information available.
Other Adverse Effects
The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity
Do not empty into drains.

<table>
<thead>
<tr>
<th>Component</th>
<th>Freshwater Algae</th>
<th>Freshwater Fish</th>
<th>Microtox</th>
<th>Water Flea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen fluoride</td>
<td>Not listed</td>
<td>LC50 = 660 mg/L, 48h (Leuciscus idus)</td>
<td>Not listed</td>
<td>EC50 = 270 mg/L, 48h (Daphnia species)</td>
</tr>
</tbody>
</table>

Persistence and Degradability
Soluble in water. Persistence is unlikely based on information available. Miscible with water.

Bioaccumulation/ Accumulation
No information available.

Mobility
Will likely be mobile in the environment due to its water solubility.

<table>
<thead>
<tr>
<th>Component</th>
<th>log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen fluoride</td>
<td>-1.4</td>
</tr>
</tbody>
</table>

13. Disposal considerations

Waste Disposal Methods
Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

<table>
<thead>
<tr>
<th>Component</th>
<th>RCRA - U Series Wastes</th>
<th>RCRA - P Series Wastes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen fluoride - 7664-39-3</td>
<td>U134</td>
<td>-</td>
</tr>
</tbody>
</table>

14. Transport information

DOT
UN-No: UN1790
Proper Shipping Name: HYDROFLUORIC ACID
Hazard Class: 8
Subsidiary Hazard Class: 6.1
Packing Group: II

TDG
UN-No: UN1790
Proper Shipping Name: HYDROFLUORIC ACID
Hazard Class: 8
Subsidiary Hazard Class: 6.1
Packing Group: II

IATA
UN-No: UN1790
Proper Shipping Name: HYDROFLUORIC ACID
Hazard Class: 8
Subsidiary Hazard Class: 6.1
Packing Group: II

IMDG/IMO
UN-No: UN1790
Proper Shipping Name: HYDROFLUORIC ACID
Hazard Class: 8
Subsidiary Hazard Class: 6.1
Packing Group: II

15. Regulatory information

All of the components in the product are on the following Inventory lists: X = listed

International Inventories
HYDROFLUORIC ACID

Component | TSCA | DSL | NDSL | EINECS | ELINCS | NLP | PICCS | ENCS | AICS | IECSC | KECL
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
Hydrogen fluoride | X | X | - | 231-634-8 | - | X | X | X | X | X | X
Water | X | X | - | 231-791-2 | - | X | - | X | X | X | X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313

Component | CAS-No | Weight % | SARA 313 - Threshold Values %
--- | --- | --- | ---
Hydrogen fluoride | 7664-39-3 | 40-60 | 1.0

SARA 311/312 Hazard Categories
- Acute Health Hazard: Yes
- Chronic Health Hazard: Yes
- Fire Hazard: No
- Sudden Release of Pressure Hazard: No
- Reactive Hazard: No

CWA (Clean Water Act)

Component | CWA - Hazardous Substances | CWA - Reportable Quantities | CWA - Toxic Pollutants | CWA - Priority Pollutants
--- | --- | --- | --- | ---
Hydrogen fluoride | X | 100 lb | - | -

Clean Air Act

Component | HAPS Data | Class 1 Ozone Depleters | Class 2 Ozone Depleters
--- | --- | --- | ---
Hydrogen fluoride | X | - | -

OSHA Occupational Safety and Health Administration
Not applicable

Component | Specifically Regulated Chemicals | Highly Hazardous Chemicals
--- | --- | ---
Hydrogen fluoride | - | TQ: 1000 lb

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)

Component | Hazardous Substances RQs | CERCLA EHS RQs
--- | --- | ---
Hydrogen fluoride | 100 lb | 100 lb

California Proposition 65 This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Component | Massachusetts | New Jersey | Pennsylvania | Illinois | Rhode Island
--- | --- | --- | --- | --- | ---
Hydrogen fluoride | X | X | X | X | X
HYDROFLUORIC ACID

U.S. Department of Transportation

Reportable Quantity (RQ): N
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product contains the following DHS chemicals:

<table>
<thead>
<tr>
<th>Component</th>
<th>DHS Chemical Facility Anti-Terrorism Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen fluoride</td>
<td>750 lb STQ (50% concentration or greater)</td>
</tr>
</tbody>
</table>

Other International Regulations

Mexico - Grade
No information available

16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 06-Jul-2010
Revision Date 24-May-2017
Print Date 24-May-2017
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

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 SDS