SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

- Trade name: AMMONIUM BIFLUORIDE
- Chemical name: Ammonium hydrogendifluoride
- Synonyms: Ammonium hydrogen fluoride
- Molecular formula: NH4F.HF

1.2 Relevant identified uses of the substance or mixture and uses advised against

Uses of the Substance / Mixture
- Cleaning agent
- Metal treatment
- Non-metal-surface treatment products
- Oil & gas industry
- Chemical intermediate

1.3 Details of the supplier of the safety data sheet

Company
SOLVAY FLUORIDES, LLC
3737 Buffalo Speedway,
Suite 800,
Houston, TX 77098
USA
Tel: 800-515-6065

1.4 Emergency telephone

FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT: CHEMTREC 800-424-9300 within the United States and Canada, or 703-527-3887 for international collect calls.

SECTION 2: Hazards identification

Although OSHA has not adopted the environmental portion of the GHS regulations, this document may include information on environmental effects.

2.1 Classification of the substance or mixture

HCS 2012 (29 CFR 1910.1200)

- Acute toxicity, Category 3: H301: Toxic if swallowed.
- Skin corrosion, Category 1B: H314: Causes severe skin burns and eye damage.
- Serious eye damage, Category 1: H318: Causes serious eye damage.
2.2 Label elements

HCS 2012 (29 CFR 1910.1200)

Pictogram

Signal Word
- Danger

Hazard Statements
- H301 Toxic if swallowed.
- H314 Causes severe skin burns and eye damage.

Precautionary Statements

Prevention
- P260 Do not breathe dusts or mists.
- P264 Wash skin thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response
- P301 + P310 + P330 IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.
- 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 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
- P305 + P351 + P338 + P310 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/doctor.
- P363 Wash contaminated clothing before reuse.

Storage
- P405 Store locked up.

Disposal
- P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Other hazards which do not result in classification

- Toxic if swallowed.
- Causes burns.
- Hazardous decomposition products formed under fire conditions.
- Hydrogen fluoride
- Chronic exposure may entail dental or skeletal fluorosis

SECTION 3: Composition/information on ingredients

3.1 Substance
Hazardous Ingredients and Impurities

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Identification number CAS-No.</th>
<th>Concentration [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium fluoride ((NH₄)(HF₂))</td>
<td>1341-49-7</td>
<td>&gt;= 95 - &lt; 99</td>
</tr>
<tr>
<td>Ammonium fluoride ((NH₄)F)</td>
<td>12125-01-8</td>
<td>&gt;= 1 - &lt; 5</td>
</tr>
</tbody>
</table>

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

3.2 Mixture

Not applicable, this product is a substance.

SECTION 4: First aid measures

4.1 Description of first-aid measures

In case of inhalation
- In case of accident by inhalation: remove casualty to fresh air and keep at rest.
- Oxygen or artificial respiration if needed.
- Victim to lie down in the recovery position, cover and keep him warm.
- Call a physician immediately.
- Take victim immediately to hospital.

In case of skin contact
- Call a physician immediately.
- Take victim immediately to hospital.
- Take off contaminated clothing and shoes immediately.
- Wash off with plenty of water.
- First treatment with calcium gluconate paste.

In case of eye contact
- Immediate medical attention is required.
- Take victim immediately to hospital.
- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- In the case of difficulty of opening the lids, administer an analgesic eye wash (oxybuprocaine).

In case of ingestion
- Call a physician immediately.
- Take victim immediately to hospital.
- If victim is conscious:
  - Rinse mouth with water.
  - Give to drink a 1% aqueous calcium gluconate solution.
  - Do NOT induce vomiting.
  - Artificial respiration and/or oxygen may be necessary.

4.2 Most important symptoms and effects, both acute and delayed

In case of inhalation

Symptoms
- Breathing difficulties

Effects
- Inhalation of vapors is irritating to the respiratory system, may cause throat pain and cough.
- Aspiration may cause pulmonary edema and pneumonitis.
- At high concentrations:
  - risk of hypocalcemia with nervous problems (tetany) and cardiac arrhythmia

**Repeated or prolonged exposure**
- sore throat
- Nose bleeding
- Risk of chronic bronchitis

**In case of skin contact**

**Symptoms**
- Irritation
- Redness
- Swelling of tissue
- Burn

**Effects**
- Causes severe burns.
- Risk of shock.
- Risk of hypocalcemia following the extent of the lesions.

**In case of eye contact**

**Symptoms**
- Lachrymation
- Redness
- Swelling of tissue
- Burn

**Effects**
- May cause permanent eye injury.
- May cause blindness.

**In case of ingestion**

**Symptoms**
- Nausea
- Bloody vomiting
- Abdominal pain
- Diarrhea
- Cough
- Severe shortness of breath

**Effects**
- If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.
- Risk of throat (o)edema and suffocation.
- Risk of chemical pneumonitis from product inhalation.
- Risk of hypocalcemia with nervous problems (tetany) and cardiac arrhythmia
- Risk of convulsions, loss of consciousness, deep coma and cardiopulmonary arrest.

**4.3 Indication of any immediate medical attention and special treatment needed**
## SECTION 5: Firefighting measures

<table>
<thead>
<tr>
<th>Property</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flash point</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Autoignition temperature</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Flammability / Explosive limit</strong></td>
<td>no data available</td>
</tr>
</tbody>
</table>

### 5.1 Extinguishing media

- **Suitable extinguishing media**
  - Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

- **Unsuitable extinguishing media**
  - Water may be ineffective.

### 5.2 Special hazards arising from the substance or mixture

- **Specific hazards during fire fighting**
  - The product is not flammable.
  - Not combustible.
  - Hazardous decomposition products formed under fire conditions.
  - Gives off hydrogen by reaction with metals.

- **Hazardous combustion products:**
  - Hydrogen fluoride
  - Ammonia
  - Nitrogen oxides (NOx)

### 5.3 Advice for firefighters

- **Special protective equipment for fire-fighters**
  - Wear self-contained breathing apparatus and protective suit.
  - Wear chemical resistant oversuit
  - Keep from any possible contact with water.

## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

#### Advice for non-emergency personnel
- Keep away from water.
- Evacuate personnel to safe areas.
- Keep people away from and upwind of spill/leak.

#### Advice for emergency responders
- Ventilate the area.

- HF-Antidote Gel from IPS Healthcare is recommended as treatment for injuries from hydrofluoric acid.
- If skin irritation occurs:
  - Immediately apply calcium gluconate gel 2.5% and massage into the affected area using rubber gloves; continue to massage while repeatedly applying gel until 15 minutes after pain is relieved.
- Wear self-contained breathing apparatus and protective suit.
- Keep away from water.
- Prevent further leakage or spillage.

6.2 Environmental precautions
- Discharge into the environment must be avoided.
- If the product contaminates rivers and lakes or drains inform respective authorities.
- Prevent product from entering sewage system.

6.3 Methods and materials for containment and cleaning up
- Pick up and arrange disposal without creating dust.
- Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
- Refer to protective measures listed in sections 7 and 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
- Used in closed system
- Use only in well-ventilated areas.
- Keep away from incompatible products

Hygiene measures
- Ensure that eyewash stations and safety showers are close to the workstation location.
- Take off contaminated clothing and shoes immediately.
- Wash contaminated clothing before re-use.
- May not get in touch with:
  - Leather
- When using do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions
- Store in original container.
- Keep in a well-ventilated place.
- Keep in a dry place.
- Keep in properly labeled containers.
- Keep container closed.
- Avoid dust formation.
- Keep away from incompatible products

Packaging material

Suitable material
- Paper.
- Polyethylene

Unsuitable material
- Metals

7.3 Specific end use(s)
SECTION 8: Exposure controls/personal protection

Introductory Remarks: These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

8.1 Control parameters

Components with workplace occupational exposure limits

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Value type</th>
<th>Value</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium fluoride ((NH₄)(HF₂))</td>
<td>TWA</td>
<td>2.5 mg/m³</td>
<td>Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td></td>
<td>CAS number varies with compound</td>
<td></td>
<td>Expressed as :Fluorine</td>
</tr>
<tr>
<td>Ammonium fluoride ((NH₄)(HF₂))</td>
<td>TWA</td>
<td>2.5 mg/m³</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
<tr>
<td></td>
<td>Expressed as :Fluorine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ammonium fluoride ((NH₄)F)</td>
<td>TWA</td>
<td>2.5 mg/m³</td>
<td>Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td></td>
<td>CAS number varies with compound</td>
<td></td>
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<td>TWA</td>
<td>2.5 mg/m³</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
<tr>
<td></td>
<td>Expressed as :Fluorine</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NIOSH IDLH (Immediately Dangerous to Life or Health Concentrations)

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium fluoride ((NH₄)(HF₂))</td>
<td>1341-49-7</td>
<td>250 mg/m³</td>
</tr>
<tr>
<td>Ammonium fluoride ((NH₄)F)</td>
<td>12125-01-8</td>
<td>250 milligram per cubic meter</td>
</tr>
</tbody>
</table>

Biological Exposure Indices

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Value type</th>
<th>Value</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium fluoride ((NH₄)(HF₂))</td>
<td>BEI</td>
<td>2 mg/l Fluoride Urine Prior to shift (16 hours after exposure ceases)</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
<tr>
<td>Ammonium fluoride ((NH₄)(HF₂))</td>
<td>BEI</td>
<td>3 mg/l Fluoride Urine End of shift (As soon as possible after exposure ceases)</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
</tbody>
</table>
### 8.2 Exposure controls

**Control measures**

**Engineering measures**
- Provide adequate ventilation.
- Apply technical measures to comply with the occupational exposure limits.

**Individual protection measures**

**Respiratory protection**
- In the case of hazardous fumes, wear self contained breathing apparatus.
- In the case of dust or aerosol formation use respirator with an approved filter.
- Respirator with a dust filter
- Use only respiratory protection that conforms to international/ national standards.
- Use NIOSH approved respiratory protection.

**Hand protection**
- Impervious gloves
- Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).

**Suitable material**
- Neoprene
- Fluoroelastomer

**Eye protection**
- Dust proof goggles obligatory.

**Skin and body protection**
- Impervious clothing

**Hygiene measures**
- Ensure that eyewash stations and safety showers are close to the workstation location.
- Take off contaminated clothing and shoes immediately.
- Wash contaminated clothing before re-use.
- May not get in touch with:
  - Leather
  - When using do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice.

<table>
<thead>
<tr>
<th>Ammonium fluoride ((NH₄)F)</th>
<th>BEI</th>
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<th>American Conference of Governmental Industrial Hygienists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium fluoride ((NH₄)F)</td>
<td>BEI</td>
<td>3 mg/l Fluoride Urine End of shift (As soon as possible after exposure ceases)</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
</tbody>
</table>
### SECTION 9: Physical and chemical properties

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product information phone number in Section 1 for its exact specifications.

#### 9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td></td>
</tr>
<tr>
<td>Form:</td>
<td>flakes, strongly hygroscopic</td>
</tr>
<tr>
<td>Physical state:</td>
<td>solid</td>
</tr>
<tr>
<td>Color:</td>
<td>white</td>
</tr>
<tr>
<td>Particle size:</td>
<td>5 - 10 mm</td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>pungent</td>
</tr>
<tr>
<td><strong>Odor Threshold</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Molecular weight</strong></td>
<td>57 g/mol</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>3.5 ( 5 %)</td>
</tr>
<tr>
<td><strong>pKa</strong></td>
<td>6.4</td>
</tr>
<tr>
<td><strong>Melting point/freezing point</strong></td>
<td>258.1 - 259 °F (125.6 - 126 °C)</td>
</tr>
<tr>
<td><strong>Initial boiling point and boiling range</strong></td>
<td>Boiling point/boiling range: 463.1 - 464 °F (239.5 - 240 °C)</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Evaporation rate (Butylacetate = 1)</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
<td>The product is not flammable.</td>
</tr>
<tr>
<td><strong>Flammability / Explosive limit</strong></td>
<td>Explosiveness:</td>
</tr>
<tr>
<td></td>
<td>Not explosive</td>
</tr>
<tr>
<td><strong>Autoignition temperature</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Vapor pressure</strong></td>
<td>0.81 mmHg (1.08 hPa) ( 68 °F (20 °C))</td>
</tr>
<tr>
<td><strong>Vapor density</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Density</strong></td>
<td>Bulk density: 700 kg/m3</td>
</tr>
<tr>
<td><strong>Relative density</strong></td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Solubility</strong></td>
<td>Water solubility: 602 g/l ( 68 °F (20 °C))</td>
</tr>
<tr>
<td><strong>Partition coefficient: n-octanol/water</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Decomposition temperature</strong></td>
<td>&gt;= 463.1 °F (&gt;= 239.5 °C)</td>
</tr>
<tr>
<td><strong>Viscosity</strong></td>
<td>no data available</td>
</tr>
</tbody>
</table>
9.2 Other information
no data available

SECTION 10: Stability and reactivity

10.1 Reactivity
- Reacts violently with water.

10.2 Chemical stability
- Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
- May be corrosive to metals. Gives off hydrogen by reaction with metals.

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

10.5 Incompatible materials
- Strong acids and strong bases
- Silicate containing materials (glass, cement,...).
- Metals

10.6 Hazardous decomposition products
- Hydrogen fluoride
- Ammonia
- Nitrogen oxides (NOx)

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity
Ammonium fluoride \((\text{NH}_4)(\text{HF}_2)\)
LD50: 130 mg/kg - Rat, male and female
Method: OECD Test Guideline 401
This product is classified as acute toxicity category 3
Unpublished reports

Acute inhalation toxicity
no data available

Acute dermal toxicity
no data available

Acute toxicity (other routes of administration)
no data available
Skin corrosion/irritation  
Corrosive

Serious eye damage/eye irritation  
Severe eye irritation

Respiratory or skin sensitization  
Did not cause sensitization on laboratory animals.

Mutagenicity  
Genotoxicity in vitro  
Ammonium fluoride ((NH4)(HF2))  
Mutagenicity (Salmonella typhimurium - reverse mutation assay) with and without metabolic activation  
negative  
Method: OECD Test Guideline 471  
Unpublished reports  
In vitro tests did not show mutagenic effects  
By analogy  
Gene mutation assays in mammalian cells.  
Strain: mouse lymphoma cells with and without metabolic activation  
positive  
Method: OECD Test Guideline 476  
Published data  
In vitro tests showed mutagenic effects  
By analogy  
Chromosome aberration test in vitro  
Strain: CHO with and without metabolic activation  
ambiguous  
Method: OECD Test Guideline 473  
Published data

Genotoxicity in vivo  
Ammonium fluoride ((NH4)(HF2))  
By analogy  
In vivo tests did not show mutagenic effects

Carcinogenicity  
Ammonium fluoride ((NH4)(HF2))  
By analogy  
No carcinogenic effects have been observed

This product does not contain any ingredient designated as probable or suspected human carcinogens by:  
NTP  
IARC  
OSHA
Toxicity for reproduction and development

Toxicity to reproduction / fertility
Ammonium fluoride ((NH4)(HF2)) By analogy, No toxicity to reproduction

Developmental Toxicity/Teratogenicity
Ammonium fluoride ((NH4)(HF2)) By analogy, No embryotoxic effects have been observed in animal tests.

STOT

STOT-single exposure
Ammonium fluoride ((NH4)(HF2)) The substance or mixture is not classified as specific target organ toxicant, single exposure according to GHS criteria.

STOT-repeated exposure
Ammonium fluoride ((NH4)(HF2)) The substance or mixture is not classified as specific target organ toxicant, repeated exposure according to GHS criteria.
Ammonium fluoride ((NH4)(HF2)) By analogy No irreversible effects were observed during chronic oral toxicity tests.
By analogy No irreversible effect or symptom of silicosis were observed during the inhalation toxicity tests.

Neurological effects
Ammonium fluoride ((NH4)(HF2)) By analogy, No neurotoxic effects observed.

Experience with human exposure
no data available

Aspiration toxicity
no data available

Further information
Toxic effect linked with corrosive properties

SECTION 12: Ecological information

12.1 Toxicity

Aquatic Compartment

Acute toxicity to fish
Ammonium fluoride ((NH4)(HF2)) By analogy Not harmful to fish (LC/LL50 > 100 mg/L)
Acute toxicity to daphnia and other aquatic invertebrates.
Ammonium fluoride ((NH₄)(HF₂))  By analogy
Not harmful to aquatic invertebrates. (EC/EL50 > 100 mg/L)

Toxicity to aquatic plants
Ammonium fluoride ((NH₄)(HF₂))  By analogy
Not harmful to algae (EC/EL50 > 100 mg/L)
By analogy
No adverse chronic effect observed up to and including the threshold of 1 mg / L.

Toxicity to microorganisms  no data available

Chronic toxicity to fish
Ammonium fluoride ((NH₄)(HF₂))  By analogy
No adverse chronic effect observed up to and including the threshold of 1 mg / L.

Chronic toxicity to daphnia and other aquatic invertebrates.
Ammonium fluoride ((NH₄)(HF₂))  By analogy
No adverse chronic effect observed up to and including the threshold of 1 mg / L.

Chronic Toxicity to aquatic plants  no data available

12.2 Persistence and degradability

Abiotic degradation

Stability in water  Medium, Water, Soil, ionization/neutralization
Medium, Water, Soil, complexation/precipitation of inorganic materials

Photodegradation  neutralization by natural alkalinity
Medium
Air

Physical- and photo-chemical elimination  no data available

Biodegradation

Biodegradability  The methods for determining the biological degradability are not applicable to inorganic substances.
Not applicable, inorganic substance

Degradability assessment  Not applicable, inorganic substance
12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water  no data available

Bioconcentration factor (BCF)  Does not bioaccumulate.

12.4 Mobility in soil

Adsorption potential (Koc)  Water
Solubility(ies)
Mobility
Soil/sediments
potential adsorption
pH
fluorides
Air
mobility as solid aerosols

Known distribution to environmental compartments  no data available

12.5 Results of PBT and vPvB assessment  Not applicable

12.6 Other adverse effects

Ecotoxicity assessment

Acute aquatic toxicity  Ammonium fluoride ((NH₄)(HF₂))  Not harmful to aquatic life (LC/LL50, EC/EL50 > 100 mg/L)

Chronic aquatic toxicity  Ammonium fluoride ((NH₄)(HF₂))  No adverse chronic effect observed up to and including the threshold of 1 mg / L.

Remarks  No data is available on the product itself., Ecological data therefore refers only to the effects of the decomposition products., Harmful to aquatic organisms., Nevertheless, hazard for the environment is limited due to product properties:, Low chronic toxicity., Product fate is highly dependent on environmental conditions: pH, temperature, redox potential, mineral and organic content of the medium,...

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product Disposal

- Where possible recycling is preferred to disposal or incineration.
- If recycling is not practicable, dispose of in compliance with local regulations.
- Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities.
- Use lime or, preferably, calcium hydroxide to precipitate the fluoride ion in the form of CaF₂.
- Filtrate the product and send the cake to a landfill for industrial waste.
- Dispose of wastes in an approved waste disposal facility.
- In accordance with local and national regulations.

**Waste Code**
- Environmental Protection Agency
- Hazardous Waste – YES
- RCRA Hazardous Waste (40 CFR 302)
- D002 - Corrosive waste – (C)

**Advice on cleaning and disposal of packaging**
- Dispose of as unused product.
- Where possible recycling is preferred to disposal or incineration.

**SECTION 14: Transport information**

Transportation status: IMPORTANT! Statements below provide additional data on listed transport classification.
The listed Transportation Classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptors.

**DOT**

14.1 UN number UN 1727
14.2 Proper shipping name AMMONIUM HYDROGENDIFLUORIDE, SOLID
14.3 Transport hazard class 8
   Label(s) 8
14.4 Packing group Packing group II
   ERG No 154
14.5 Environmental hazards Marine pollutant NO

**TDG**

14.1 UN number UN 1727
14.2 Proper shipping name AMMONIUM HYDROGENDIFLUORIDE, SOLID
14.3 Transport hazard class 8
   Label(s) 8
14.4 Packing group Packing group II
   ERG No 154
14.5 Environmental hazards Marine pollutant NO
14.1 UN number
UN 1727

14.2 Proper shipping name
AMMONIUM HYDROGEN DIFLUORIDE, SOLID

14.3 Transport hazard class
8
Label(s)
8

14.4 Packing group
Packing group
II
ERG No
154

14.5 Environmental hazards
Marine pollutant
NO

14.6 Special precautions for user
EmS
F-A , S-B

For personal protection see section 8.
SAFETY DATA SHEET

AMMONIUM BIFLUORIDE

Revision Date  12/19/2017

IATA

14.1 UN number UN 1727

14.2 Proper shipping name AMMONIUM HYDROGENDIFLUORIDE, SOLID

14.3 Transport hazard class 8
Label(s): 8

14.4 Packing group II
Packing group
Packing instruction (cargo aircraft) 863
Max net qty / pkg 50.00 kg
Packing instruction (passenger aircraft) 859
Max net qty / pkg 15.00 kg

14.5 Environmental hazards NO

14.6 Special precautions for user
For personal protection see section 8.

Note: The above regulatory prescriptions are those valid on the date of publication of this sheet. Given the possible evolution of transportation regulations for hazardous materials, it would be advisable to check their validity with your sales office.

SECTION 15: Regulatory information

15.1 Notification status

<table>
<thead>
<tr>
<th>Inventory Information</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States TSCA Inventory</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>Mexico INSQ (INSQ)</td>
<td>In compliance with the inventory</td>
</tr>
<tr>
<td>Canadian Domestic Substances List (DSL)</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>New Zealand. Inventory of Chemical Substances</td>
<td>In compliance with the inventory</td>
</tr>
<tr>
<td>Australia Inventory of Chemical Substances (AICS)</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>Japan. CSCL - Inventory of Existing and New Chemical Substances</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>Korea. Korean Existing Chemicals Inventory (KECI)</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>China. Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>Philippines Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>EU. European Registration, Evaluation, Authorisation and Restriction of Chemical (REACH)</td>
<td>If product is purchased from Solvay in Europe it is in compliance with REACH, if not please contact the supplier.</td>
</tr>
</tbody>
</table>
15.2 Federal Regulations

**US. EPA EPCRA SARA Title III**

**SARA HAZARD DESIGNATION SECTIONS 311/312 (40 CFR 370)**

<table>
<thead>
<tr>
<th>Hazard Category</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Health Hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Chronic Health Hazard</td>
<td>Yes</td>
</tr>
</tbody>
</table>

The categories not mentioned are not relevant for the product.

**Section 313 Toxic Chemicals (40 CFR 372.65)**

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.

**Section 302 Emergency Planning Extremely Hazardous Substance Threshold Planning Quantity (40 CFR 355)**

This material does not contain any components with a section 302 EHS TPQ.

**Section 302 Emergency Planning Extremely Hazardous Substance Reportable Quantity (40 CFR 355)**

This material does not contain any components with a SARA 302 RQ.

**Section 304 Emergency Release Notification Reportable Quantity (40 CFR 355)**

This material does not contain any components with a section 304 EHS RQ.

**US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS-No.</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium fluoride ((NH4)(HF2))</td>
<td>1341-49-7</td>
<td>100 lb</td>
</tr>
</tbody>
</table>

15.3 State Regulations

**US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)**

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

**SECTION 16: Other information**

**NFPA (National Fire Protection Association) - Classification**

<table>
<thead>
<tr>
<th>Category</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>3 serious</td>
</tr>
<tr>
<td>Flammability</td>
<td>0 minimal</td>
</tr>
<tr>
<td>Instability or Reactivity</td>
<td>1 slight</td>
</tr>
<tr>
<td>Special Notices</td>
<td>None</td>
</tr>
</tbody>
</table>

**HMIS (Hazardous Materials Identification System (Paint & Coating)) - Classification**

<table>
<thead>
<tr>
<th>Category</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>3 serious</td>
</tr>
<tr>
<td>Flammability</td>
<td>0 minimal</td>
</tr>
<tr>
<td>Reactivity</td>
<td>1 slight</td>
</tr>
<tr>
<td>PPE</td>
<td>Determined by User; dependent on local conditions</td>
</tr>
</tbody>
</table>
Further information

- Product evaluated under the US GHS format.

Date Prepared: 12/19/2017

Key or legend to abbreviations and acronyms used in the safety data sheet

- TWA 8-hour, time-weighted average
- ACGIH American Conference of Governmental Industrial Hygienists
- OSHA Occupational Safety and Health Administration
- NTP National Toxicology Program
- IARC International Agency for Research on Cancer
- NIOSH National Institute for Occupational Safety and Health

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. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose, and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. It should be used in conjunction with technical sheets but do not replace them. Thus, the information only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in any other manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.