# SAFETY DATA SHEET

## 1. Identification

**Product identifier:** AMMONIUM FLUORIDE

**Other means of identification**

**Product No.:** 0698

**Recommended use and restriction on use**

- **Recommended use:** Not available.
- **Restrictions on use:** Not known.

**Manufacturer/Importer/Supplier/Distributor information**

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Company Name:</th>
<th>Avantor Performance Materials, Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>3477 Corporate Parkway, Suite 200 Center Valley, PA 18034</td>
<td></td>
</tr>
<tr>
<td>Telephone:</td>
<td>Customer Service: 855-282-6867</td>
<td></td>
</tr>
<tr>
<td>Fax:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact Person:</td>
<td>Environmental Health &amp; Safety</td>
<td></td>
</tr>
<tr>
<td>e-mail:</td>
<td><a href="mailto:info@avantormaterials.com">info@avantormaterials.com</a></td>
<td></td>
</tr>
</tbody>
</table>

**Emergency telephone number:**

- 24 Hour Emergency: 908-859-2151
- Chemtrec: 800-424-9300

## 2. Hazard(s) identification

**Hazard classification**

### Health hazards

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity (Oral)</td>
<td>3</td>
</tr>
<tr>
<td>Acute toxicity (Dermal)</td>
<td>3</td>
</tr>
<tr>
<td>Acute toxicity (Inhalation - vapor)</td>
<td>3</td>
</tr>
<tr>
<td>Specific target organ toxicity - single exposure</td>
<td>3</td>
</tr>
</tbody>
</table>

**Label elements**

**Hazard symbol:**

![Hazard symbol](image)

**Signal word:** Danger

**Hazard statement:**

- Toxic in contact with skin.
- Toxic if inhaled.
- Toxic if swallowed.
- May cause respiratory irritation.
- May cause drowsiness or dizziness.

**Precautionary statement**

SDS_US - SDS0000001613
Prevention: Wear protective gloves/protective clothing/eye protection/face protection. Avoid breathing dust/fume/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area. Wash hands thoroughly after handling.

Response: IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or doctor/physician if you feel unwell. Take off immediately all contaminated clothing and wash it before reuse. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician. Rinse mouth.

Other hazards which do not result in GHS classification: None.

3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Chemical identity</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>Content in percent (%)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMMONIUM FLUORIDE</td>
<td></td>
<td>12125-01-8</td>
<td>100%</td>
</tr>
</tbody>
</table>

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

General information: Get medical advice/attention if you feel unwell. Show this safety data sheet to the doctor in attendance.

Ingestion: Rinse mouth. Call a physician or poison control center immediately. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Inhalation: Move to fresh air. Call a POISON CENTER or doctor/physician.

Skin contact: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash contaminated clothing before reuse. Call a POISON CENTER or doctor/physician if you feel unwell.

Eye contact: Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention immediately.

Most important symptoms/effects, acute and delayed

Symptoms: Irritating to eyes, respiratory system and skin.

Indication of immediate medical attention and special treatment needed

Treatment: Treat symptomatically. Symptoms may be delayed.

5. Fire-fighting measures

General fire hazards: In case of fire and/or explosion do not breathe fumes.
Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable extinguishing media: None known.

Specific hazards arising from the chemical: Contact with metals may evolve flammable hydrogen gas. Fire may produce irritating, corrosive and/or toxic gases.

Special protective equipment and precautions for firefighters

Special fire fighting procedures: Move containers from fire area if you can do so without risk. Use water spray to keep fire-exposed containers cool. Cool containers exposed to flames with water until well after the fire is out.

Special protective equipment for fire-fighters: Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures: Keep unauthorized personnel away. Use personal protective equipment. See Section 8 of the MSDS for Personal Protective Equipment. Ventilate closed spaces before entering them. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Methods and material for containment and cleaning up: Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination. Dike far ahead of larger spill for later recovery and disposal.

Notification Procedures: Dike for later disposal. Prevent entry into waterways, sewer, basements or confined areas. Stop the flow of material, if this is without risk. Inform authorities if large amounts are involved.

Environmental precautions: Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling: Wash hands thoroughly after handling. Do not taste or swallow. Avoid contact with skin. Avoid contact with eyes. Do not breathe dust/fume/mist. Do not eat, drink or smoke when using the product. Use only with adequate ventilation. Wash hands after handling. See Section 8 of the MSDS for Personal Protective Equipment.

Conditions for safe storage, including any incompatibilities: Keep container tightly closed. Store in a well-ventilated place. Keep away from acids. Do not store in metal containers.
8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

<table>
<thead>
<tr>
<th>Chemical identity</th>
<th>Type</th>
<th>Exposure Limit values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMMONIUM FLUORIDE - as F</td>
<td>TWA</td>
<td>2.5 mg/m³</td>
<td>US. ACGIH Threshold Limit Values (2011)</td>
</tr>
<tr>
<td></td>
<td>REL</td>
<td>2.5 mg/m³</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2010)</td>
</tr>
<tr>
<td></td>
<td>PEL</td>
<td>2.5 mg/m³</td>
<td>US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)</td>
</tr>
<tr>
<td>AMMONIUM FLUORIDE - Dust</td>
<td>TWA</td>
<td>2.5 mg/m³</td>
<td>US. OSHA Table Z-1-A (29 CFR 1910.1000) (02 2006)</td>
</tr>
</tbody>
</table>

Biological limit values

<table>
<thead>
<tr>
<th>Chemical identity</th>
<th>Exposure Limit values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMMONIUM FLUORIDE</td>
<td>2 mg/l (Urine)</td>
<td>ACGIH BEL (02 2012)</td>
</tr>
<tr>
<td>(fluorides: Sampling time: Prior to shift.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMMONIUM FLUORIDE</td>
<td>3 mg/l (Urine)</td>
<td>ACGIH BEL (02 2012)</td>
</tr>
<tr>
<td>(fluorides: Sampling time: End of shift.)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Appropriate engineering controls

Individual protection measures, such as personal protective equipment

General information: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. An eye wash and safety shower must be available in the immediate work area.

Eye/face protection: Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection

Hand protection: Chemical resistant gloves

Other: Wear suitable protective clothing.

Respiratory protection: In case of inadequate ventilation use suitable respirator.

Hygiene measures: Provide eyewash station and safety shower. Observe good industrial hygiene practices. Wash contaminated clothing before reuse. Avoid contact with skin. Wash hands before breaks and immediately after handling the product. Do not eat, drink or smoke when using the product. Wash hands after handling. Avoid contact with eyes.

9. Physical and chemical properties

Appearance

Physical state: Solid

Form: Crystals

Color: Colorless

Odor: Odorless

Odor threshold: No data available.
pH: No data available.
Melting point/freezing point: Sublimes upon heating.
Initial boiling point and boiling range: Not applicable
Flash Point: Not applicable
Evaporation rate: No data available.
Flammability (solid, gas): No data available.

Upper/lower limit on flammability or explosive limits
- Flammability limit - upper (%): No data available.
- Flammability limit - lower (%): No data available.
- Explosive limit - upper (%): No data available.
- Explosive limit - lower (%): No data available.

Vapor pressure: Estimated < 0.01 kPa (25 °C)
Vapor density: No data available.
Relative density: 1.01 (20 °C)
Solubility(ies)
- Solubility in water: 1,000 g/l (0 °C)
- Solubility (other): No data available.
Partition coefficient (n-octanol/water): No data available.
Auto-ignition temperature: No data available.
Decomposition temperature: No data available.
Viscosity: No data available.

Other information
- Molecular weight: 37.04 g/mol (FH4N)

10. Stability and reactivity

Reactivity: No dangerous reaction known under conditions of normal use.
Chemical stability: Material is stable under normal conditions.
Possibility of hazardous reactions: Hazardous polymerization does not occur.

Hazardous decomposition products: Nitrogen Oxides Hydrogen fluoride.

11. Toxicological information

Information on likely routes of exposure
- Ingestion: Toxic if swallowed.
- Inhalation: Toxic if inhaled. Irritating to respiratory system.
- Skin contact: Toxic in contact with skin. Causes skin irritation.
- Eye contact: Causes eye irritation.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)
- Oral Product: No data recorded.
Dermal
Product: No data available.

Inhalation
Product: No data available.

Repeated dose toxicity
Product: No data available.

Skin corrosion/irritation
Product: Irritating to skin.

Serious eye damage/eye irritation
Product: Irritating to eyes.

Respiratory or skin sensitization
Product: Not a skin sensitizer.

Carcinogenicity
Product: This substance has no evidence of carcinogenic properties.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:
No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens:
No carcinogenic components identified

No carcinogenic components identified

Germ cell mutagenicity

In vitro
Product: No mutagenic components identified

In vivo
Product: No mutagenic components identified

Reproductive toxicity
Product: No components toxic to reproduction

Specific target organ toxicity - single exposure
Product: Respiratory tract irritation., Eyes., Bones, Teeth

Specific target organ toxicity - repeated exposure
Product: None known.

Aspiration hazard
Product: Not classified

Other effects: None known.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish
Product: No data available.
Aquatic invertebrates
Product: No data available.

Chronic hazards to the aquatic environment:
Fish
Product: No data available.

Aquatic invertebrates
Product: No data available.

Toxicity to Aquatic Plants
Product: No data available.

Persistence and degradability
Biodegradation
Product: There are no data on the degradability of this product.

BOD/COD ratio
Product: No data available.

Bioaccumulative potential
Bioconcentration factor (BCF)
Product: No data available on bioaccumulation.

Partition coefficient n-octanol / water (log Kow)
Product: No data available.

Mobility in soil: The product is water soluble and may spread in water systems.

Other adverse effects: No data on possible environmental effects have been found.

13. Disposal considerations

Disposal instructions: Discharge, treatment, or disposal may be subject to national, state, or local laws. Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Contaminated packaging: Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT
UN number: UN 2505
UN proper shipping name: Ammonium fluoride
Transport hazard class(es)
Class(es): 6.1
Label(s): 6.1
Packing group: III
Marine Pollutant: No
IMDG
UN number: UN 2505
UN proper shipping name: AMMONIUM FLUORIDE
Transport hazard class(es):
   Class(es): 6.1
   Label(s): 6.1
   EmS No.: F-A, S-A
Packing group: III
Marine Pollutant: No

IATA
UN number: UN 2505
Proper Shipping Name: Ammonium fluoride
Transport hazard class(es):
   Class(es): 6.1
   Label(s): 6.1
Marine Pollutant: No
Packing group: III

15. Regulatory information

US federal regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):
AMMONIUM FLUORIDE Reportable quantity: 100 lbs.

Superfund amendments and reauthorization act of 1986 (SARA)

Hazard categories

[X] Acute (Immediate) [X] Chronic (Delayed) [ ] Fire [ ] Reactive [ ] Pressure Generating

SARA 302 Extremely hazardous substance
None present or none present in regulated quantities.

SARA 304 Emergency release notification

Chemical identity RQ
AMMONIUM FLUORIDE 100 lbs.

SARA 311/312 Hazardous chemical

Chemical identity Threshold Planning Quantity
AMMONIUM FLUORIDE 500 lbs

SARA 313 (TRI reporting)

Chemical identity Reporting threshold for other users Reporting threshold for manufacturing and processing
AMMONIUM FLUORIDE 10000 lbs 25000 lbs.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)
AMMONIUM FLUORIDE Reportable quantity: 100 lbs.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):
None present or none present in regulated quantities.
US state regulations

US. California Proposition 65
No ingredient regulated by CA Prop 65 present.

US. New Jersey Worker and Community Right-to-Know Act
AMMONIUM FLUORIDE  Listed

US. Massachusetts RTK - Substance List
AMMONIUM FLUORIDE  Listed

US. Pennsylvania RTK - Hazardous Substances
AMMONIUM FLUORIDE  Listed

US. Rhode Island RTK
AMMONIUM FLUORIDE  Listed

Inventory Status:
Australia AICS: On or in compliance with the inventory
Canada DSL Inventory List: On or in compliance with the inventory
EINECS, ELINCS or NLP: On or in compliance with the inventory
Japan (ENCS) List: On or in compliance with the inventory
China Inv. Existing Chemical Substances: Not in compliance with the inventory.
Korea Existing Chemicals Inv. (KECI): On or in compliance with the inventory
Canada NDSL Inventory: Not in compliance with the inventory.
Philippines PICCS: On or in compliance with the inventory
US TSCA Inventory: On or in compliance with the inventory
New Zealand Inventory of Chemicals: On or in compliance with the inventory
Japan ISHL Listing: On or in compliance with the inventory
Japan Pharmacopoeia Listing: Not in compliance with the inventory.

16. Other information, including date of preparation or last revision

NFPA Hazard ID

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe

Issue date: 07-10-2014
Revision date: No data available.
Version #: 1.0
Further information: No data available.
Disclaimer:

THE INFORMATION PRESENTED IN THIS MATERIAL SAFETY DATA SHEET (MSDS/SDS) WAS PREPARED BY TECHNICAL PERSONNEL BASED ON DATA THAT THEY BELIEVE IN THEIR GOOD FAITH JUDGMENT IS ACCURATE. HOWEVER, THE INFORMATION PROVIDED HEREIN IS PROVIDED “AS IS,” AND AVANTOR PERFORMANCE MATERIALS MAKES AND GIVES NO REPRESENTATIONS OR WARRANTIES WHATSOEVER, AND EXPRESSLY DISCLAIMS ALL WARRANTIES REGARDING SUCH INFORMATION AND THE PRODUCT TO WHICH IT RELATES, WHETHER EXPRESS, IMPLIED, OR STATUTORY, INCLUDING WITHOUT LIMITATION WARRANTIES OF ACCURACY, COMPLETENESS, MERCHANTABILITY, NON-INFRINGEMENT, PERFORMANCE, SAFETY, SUITABILITY, STABILITY, AND FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE, OR USAGE OF TRADE. THIS MSDS/SDS IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE MATERIAL BY A PROPERLY TRAINED PERSON USING THIS PRODUCT, AND IS NOT INTENDED TO BE COMPREHENSIVE AS TO THE MANNER AND CONDITIONS OF USE, HANDLING, STORAGE, OR DISPOSAL OF THE PRODUCT. INDIVIDUALS RECEIVING THIS MSDS/SDS MUST ALWAYS EXERCISE THEIR OWN INDEPENDENT JUDGMENT IN DETERMINING THE APPROPRIATENESS OF SUCH ISSUES. ACCORDINGLY, AVANTOR PERFORMANCE MATERIALS ASSUMES NO LIABILITY WHATSOEVER FOR THE USE OF OR RELIANCE UPON THIS INFORMATION. NO SUGGESTIONS FOR USE ARE INTENDED AS, AND NOTHING HEREIN SHALL BE CONSTRUED AS, A RECOMMENDATION TO INFRINGE ANY EXISTING PATENTS OR TO VIOLATE ANY FEDERAL, STATE, LOCAL, OR FOREIGN LAWS. AVANTOR PERFORMANCE MATERIALS REMINDS YOU THAT IT IS YOUR LEGAL DUTY TO MAKE ALL INFORMATION IN THIS MSDS/SDS AVAILABLE TO YOUR EMPLOYEES.