

## Praxair Material Safety Data Sheet

### 1. Chemical Product and Company Identification

<b>Product Name:</b> Ammonium fluoride (MSDS No. P-6298)	<b>Trade Name:</b> Ammonium Fluoride
<b>Chemical Name:</b> Ammonium fluoride	<b>Synonyms:</b> Neutral ammonium fluoride
<b>Formula:</b> NH <sub>4</sub> F	<b>Chemical Family:</b> Ammonium salt
<b>Telephone:</b>	<b>Company Name:</b> Praxair, Inc. 39 Old Ridgebury Road Danbury, CT 06810-5113
<b>Emergencies:</b> 1-800-645-4633*	
<b>CHEMTREC:</b> 1-800-424-9300*	
<b>Routine:</b> 1-800-PRAXAIR	

\* Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier, Praxair sales representative, or call 1-800-PRAXAIR (1-800-772-9247).

### 2. Composition/Information on Ingredients

See section 16 for important information about mixtures.

INGREDIENT	CAS NUMBER	CONCENTRATION	OSHA PEL	ACGIH TLV-TWA (2003)
Ammonium fluoride	12125-01-8	>99%*	2.5 mg/m <sup>3</sup> **	2.5 mg/m <sup>3</sup> **

\*The symbol > means "greater than."

\*\*Fluorides as F

### 3. Hazards Identification

#### EMERGENCY OVERVIEW



**DANGER! Poisonous, nonflammable solid.**

**Harmful or fatal if inhaled or swallowed.**

**Harmful if absorbed through the skin.**

**Causes severe eye, skin, and respiratory tract irritation.**

**Symptoms may be delayed**

**May cause permanent lung injury; liver, kidney, and bone damage.**

**Self-contained breathing apparatus must be worn by rescue workers.**

**Odor: None**



**THRESHOLD LIMIT VALUE:** TLV-TWA 2.5 mg/m<sup>3</sup>, fluorides as F (ACGIH, 2003). TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

#### EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

**INHALATION**—May cause choking, coughing, burning of the throat, and severe irritation of the respiratory tract, with possible bronchial spasms, pneumonitis (chemical pneumonia), pulmonary edema (fluid in the lungs), general lung injury, bronchitis, and death. Symptoms may be delayed.

**SKIN CONTACT**—May cause severe irritation and chemical burns associated with severe pain and deeply penetrating tissue destruction. Tissue destruction may persist for several days. With prolonged or widespread contact, harmful amounts may be absorbed through the skin.

**SWALLOWING**—Highly toxic. May cause chemical burns of the mouth, throat, esophagus, stomach, and small bowel, with salivation, nausea, diarrhea, vomiting, severe pain, dizziness, weakness, and collapse. Large doses may cause central nervous system involvement with muscle spasms and coma.

**EYE CONTACT**—May cause pain, tearing, conjunctivitis, and corneal burns.

**EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE:** Prolonged or repeated exposure may result in fluoride poisoning (fluorosis); nasal congestion; bronchitis; weight loss; anemia; weakness; excess calcification of bones, ligaments, and tendons; brittle bones; and stiff joints. Repeated overexposure may also damage the lungs, liver, and kidneys.

**OTHER EFFECTS OF OVEREXPOSURE:** None known.

**MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:** Inhalation may aggravate asthma and inflammatory or fibrotic pulmonary disease. Skin contact may aggravate an existing dermatitis.

**SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:** None known.

**CARCINOGENICITY:** Ammonium fluoride is not listed by NTP, OSHA, and IARC.

#### 4. First Aid Measures

**INHALATION:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

**SKIN CONTACT:** Immediately remove contaminated clothing and shoes. Shower with plenty of water, rinsing away all loose material; then wash thoroughly with soap and water to remove remaining particles. Discard contaminated clothing and shoes. Call a physician.

**SWALLOWING:** Contact a poison control center (see section 16) and follow their advice. Normal first aid for a conscious, alert victim is to give at least two glasses of milk or water. Do not induce vomiting. Keep victim warm. Seek immediate medical attention.

**EYE CONTACT:** Immediately flush eyes thoroughly with warm water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. See a physician, preferably an ophthalmologist, immediately.

**NOTES TO PHYSICIAN:** *Close observation should be continued 24-48 hours for pulmonary edema. See section 11, Toxicological Information.*

#### 5. Fire Fighting Measures

<b>FLASH POINT</b> (test method):	Not Applicable.
<b>AUTOIGNITION TEMPERATURE:</b>	Not Applicable.
<b>FLAMMABLE LIMITS IN AIR</b> , % by volume:	<b>LOWER:</b> Not Applicable.   <b>UPPER:</b> Not Applicable.
<b>EXTINGUISHING MEDIA:</b> Ammonium fluoride cannot catch fire. Use media appropriate for surrounding fire.	

**SPECIAL FIRE FIGHTING PROCEDURES: DANGER! Poisonous, nonflammable solid.**

Immediately evacuate all personnel from danger area. Do not approach area without self-contained breathing apparatus, protective clothing, and eye protection. Immediately cool containers with water spray from maximum distance; then move them away from fire if without risk. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** None known.

**HAZARDOUS COMBUSTION PRODUCTS:** Not applicable. Thermal decomposition produces ammonia, hydrogen fluoride, and NO<sub>x</sub>.

## 6. Accidental Release Measures

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: DANGER! Poisonous, nonflammable solid.** Immediately evacuate all personnel from danger area. Do not approach area without self-contained breathing apparatus, protective clothing, and eye protection. Vacuum or sweep up material taking care not to raise dust. Place into a suitable container for disposal. After pickup is complete, ventilate area and wash spill site.

**WASTE DISPOSAL METHOD:** Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

## 7. Handling and Storage

**PRECAUTIONS TO BE TAKEN IN STORAGE:** Store only in a cool, dry area with adequate ventilation. Store only with compatible poisons. Keep away from acids, strong bases and oxidizers, water and moisture. Keep containers tightly closed.

**PRECAUTIONS TO BE TAKEN IN HANDLING:** Handle and use only with appropriate personal protective equipment. (See section 8.) Keep containers tightly closed when not in use.

## 8. Exposure Controls/Personal Protection

### VENTILATION/ENGINEERING CONTROLS:

**LOCAL EXHAUST**—Where possible, processes should be enclosed so no ammonium fluoride dust escapes into the work area. Where dust may escape, use a corrosion-resistant system with sufficient air flow to keep the ammonium fluoride concentration below the TLV in the worker's breathing zone, or wear approved respiratory protection.

**MECHANICAL (general)**—Not recommended as a primary ventilation system to control worker's exposure.

**SPECIAL**—A corrosion-resistant, canopy type, forced-draft fume hood may be preferred for some applications.

**OTHER**—None

**RESPIRATORY PROTECTION:** Select in accordance with OSHA Standard 1910.1018. The respiratory protection use must conform with OSHA rules as specified in 29 CFR 1910.134.

**PROTECTIVE GLOVES:** Wear work gloves for container handling; neoprene, natural rubber, or nitrile gloves where needed.

**EYE PROTECTION:** Wear safety glasses when handling containers; vapor-proof goggles and a face shield wherever contact with product is possible. Select per OSHA 29 CFR 1910.133.

**OTHER PROTECTIVE EQUIPMENT:** Metatarsal shoes for container handling and protective clothing where needed. Select per OSHA 29 CFR 1910.132 and 1910.133. Regardless of protective equipment, never touch live electrical parts.

### 9. Physical and Chemical Properties

<b>MOLECULAR WEIGHT:</b>	37.04
<b>DENSITY:</b>	63.0 lb/ft <sup>3</sup> (1.009 g/cm <sup>3</sup> )
<b>SOLUBILITY IN WATER at 68°F (20°C):</b>	100 gm/100cc
<b>APPEARANCE, ODOR, AND STATE:</b>	White, odorless, tasteless powder

### 10. Stability and Reactivity

**STABILITY:**  Unstable  Stable

**INCOMPATIBILITY (materials to avoid):** Acids, bases, water (hot water solutions give off ammonia gas), glass

**HAZARDOUS DECOMPOSITION PRODUCTS:** Ammonia, hydrogen fluoride, oxides of nitrogen (NO<sub>x</sub>.) Decomposes at temperatures >212°F (100°C).

**HAZARDOUS POLYMERIZATION:**  May Occur  Will Not Occur

**CONDITIONS TO AVOID:** Incompatible materials, elevated temperatures, contact with water or moisture. Ammonium fluoride is hygroscopic and readily absorbs moisture on its surfaces without appearing to be wet.

### 11. Toxicological Information

LD<sub>50</sub>, intraperitoneal, rat—31 mg/kg

### 12. Ecological Information

Ammonium fluoride does not contain any Class I or Class II ozone-depleting chemicals. Ammonium fluoride is not listed as a marine pollutant by DOT.

### 13. Disposal Considerations

**WASTE DISPOSAL METHOD:** Do not attempt to dispose of residual or unused quantities. Contact your supplier. Also see section 6 for disposal following spills.

### 14. Transport Information

**DOT/IMO SHIPPING NAME:** Ammonium fluoride

HAZARD CLASS:	PACKING GROUP:	IDENTIFICATION NUMBER:	PRODUCT RQ:
6.1	III	UN 2505	100 lb (45.4 kg)

**SHIPPING LABEL(s):** POISON

**PLACARD (when required):** POISON

**SPECIAL SHIPPING INFORMATION:** None

### 15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

#### U.S. FEDERAL REGULATIONS:

##### EPA (ENVIRONMENTAL PROTECTION AGENCY)

**CERCLA:** COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302):

**Reportable Quantity (RQ):** 100 lb (45.4 kg)

##### SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

**SECTIONS 302/304:** Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of Extremely Hazardous Substances (EHS) (40 CFR Part 355):

**TPQ:** None

**EHS RQ:** None

**SECTIONS 311/312:** Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:

**IMMEDIATE:** Yes

**DELAYED:** Yes

**PRESSURE:** No

**REACTIVITY:** No

**FIRE:** No

**SECTION 313:** Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Ammonium fluoride is not reportable under Section 313.

**40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION:** Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Ammonium fluoride is not listed as a regulated substance.

**TSCA: TOXIC SUBSTANCES CONTROL ACT:** Ammonium fluoride is listed on the TSCA inventory.

**OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:**

**29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS:** Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Ammonium fluoride is not listed in Appendix A as a highly hazardous chemical.

**STATE REGULATIONS:**

**CALIFORNIA:** Ammonium fluoride is not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

**PENNSYLVANIA:** Ammonium fluoride is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

**16. Other Information**

Be sure to read and understand all labels and instructions supplied with all containers of this product.

**SPECIAL PRECAUTIONS:** *Poisonous, nonflammable solid.* Do not breath dust. Do not get in eyes, on skin, or on clothing. Use only with adequate ventilation or respiratory protection. (See section 8.) Have safety showers and eyewash fountains immediately available to exposed workers. Use only with materials compatible with ammonium fluoride. (See section 10.) If possible, use only in a closed system. ***Do not eat or smoke*** in areas where ammonium fluoride is used or stored. Follow OSHA Standard 1910.1018, which restricts or prohibits these and other activities in defined, regulated areas.

**MIXTURES:** When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Remember, gases and liquids have properties that can cause serious injury or death.

**HAZARD RATING SYSTEMS:****NFPA RATINGS:**

HEALTH	= 3
FLAMMABILITY	= 0
INSTABILITY	= 1
SPECIAL	= None

**HMIS RATINGS:**

HEALTH	= 3
FLAMMABILITY	= 0
PHYSICAL HAZARD	= 1

**POISON CONTROL CENTER:** Poison Control Centers provide round-the-clock medical information to aid victims of accidental poisoning. Check the emergency listings of your local phone directory for the one serving your area. (Emergency numbers usually appear on inside front cover.) If the poison control center is not listed or you are unable to locate it, contact the largest hospital in your community for the number. Post the number in areas where ammonium fluoride is stored, handled, and used.

Praxair asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

---

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

---

Praxair MSDSs are furnished on sale or delivery by Praxair or the independent distributors and suppliers who package and sell our products. To obtain current Praxair MSDSs for these products, contact your Praxair sales representative or local distributor or supplier, or download from [www.praxair.com](http://www.praxair.com). If you have questions regarding Praxair MSDSs, would like the form number and date of the latest MSDS, or would like the names of the Praxair suppliers in your area, phone or write the Praxair Call Center (**Phone:** 1-800-PRAXAIR; **Address:** Praxair Call Center, Praxair, Inc., PO Box 44, Tonawanda, NY 14151-0044).

*Praxair* and the *Flowing Airstream* design are trademarks or registered trademarks of Praxair Technology, Inc. in the United States and other countries.



Praxair, Inc.  
39 Old Ridgebury Road  
Danbury, CT 06810-5113