MATERIAL SAFETY DATA SHEET

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SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME**: BUFFER HF, SILOXIDE ETCHANT**
Other Designations: Ammonia Bifluoride Solution
Chemical Family: Inorganic acid mixture Trade Name: BUFFERED OXIDE ETCHANT

SECTION II. INGREDIENTS AND HAZARDS

	CAS Number	%	toxicity (mg/M3)
Hydrofluoric acid (HF)	7664-39-3	4-8	3ppm OSHA
Ammonium Fluoride (NH_4F)	12125-01-8	30-36	2.5 mg/M3
Distilled water		BALANCE	

SECTION III. PHYSICAL DATA

Boiling point at 1 atm: 218^{o}F
Vapor pressure at 15C, mmHg: 400
Vapor density (Air=1): 1.3
Water solubility at 20^{0}C: Complete

Specific gravity, 20/4C: 1.12
Evap. rate (BuAc =1): > 1
Volatiles % 60-90%
Molecular weight: NA

SECTION IV. FIRE AND EXPOLOSION DATA

Flash point and method / Autoignition temp. deg. C	LOWER (Flammablity Limits in air)	UPPER
Non-flammable NA	NA	NA

Extinguishing media: Use water or carbon dioxide on fires in which HF is involved. In cases of fire, the sealed container can be kept cool by spraying with water. Do not apply water to leaking containers.

Special fire fighting procedures: Wear chemically retardant gear and NIOSH approved self- contained breathing apparatus. Keep up wind of fire and avoid getting water in containers, as the acid reacts violently with water causing generation of heat and spattering.

SECTION V. REACTIVITY DATA

Stability: Unstable:
Stable: X

Conditions to avoid: Contact with metals liberates hydrogen gas. Attacks glass and reacts with silica to produce silicon tetrafluoride, a hazardous and colorless gas.

Incompatible with: High temperatures, glass, silicon compounds, As_2O_3,P_20_5,NH_3,CaO, NaOH,H_2S0_4, Ethylene Diamine and reacts with bases to liberate HF on contact with metals and hydrogen gas (H_2). On heating could yield toxic fumes of fluorides.
Hazardous decomposition products: Emits toxic fumes of HF. Reacts with acids to liberate HF and bases to liberate NH_3.

Hazardous polymerization: May occur:
Will not occur: X Conditions to avoid: Excess heat

SECTION VI. HEALTH HAZARD INFORMATION

Effects of exposure: Repeated ingestion may cause mottling on teeth and bone damage. Chronic overexposure could lead to fluorosis. Persons with pre-existing skin disorders, eye problems or impaired renal or respiratory functions may be susceptible to the effects of the substance. Hypocalcemia and hypomagnesia can occur from absorption of F-/ion into the blood stream.

FIRST AID:

EYE CONTACT: Irritant to naked eye; in case of contact flush eyes well for 15 minutes. Obtain medical attention immediately. After washing affected area, if no physician is available, instill one or two drops of .5% pontocaine solution or an equally effective aqueous topical anesthetic, followed by a second irrigation for 15 minutes. Use no oily eye drops or ointment

SKIN CONTACT: Irritant to exposed skin. Flush well with water for 15 minutes. Obtain medical attention immediately. Immerse burned area in iced aqueous Hyamine 1622 or.13% iced aqueous Zephiran, if immersion is not practical soak towels in the solution and use as compress on burns (change compress every few minutes). Apply special calcium gluconate (2.5%) paste. Remove effected clothing while flushing skin with water and get medical attention.

INHALATION: If inhaled, remove to fresh air. If not breathing give artificial respiration. Seek medical attention immediately. Keep patient warm, but not hot, and resting flat. Never give an unconscious patient anything by mouth. To discourage coughing, a conscious patient may be given cough syrup.

INGESTION: Do not induce vomiting and contact physician immediately. Encourage patient to drink large quantities of water without delay. Then give milk or two ounces of milk of magnesia.

SECTION VII. SPILL, LEAK AND DISPOSAL PROCEDURES

Soils & leaks: Ventilate area of spill or leak. Remove ignition sources since hydrogen may be generated by reaction with metals. Do not flush to sewers or waterways. Spray atmosphere with 6M-NH_4OH. Cover the contaminated surface with 50-50 mixture of soda ash and slaked lime. Mix and add water to form a slurry if necessary. Scoop up slurry and dispose of properly.

Disposal: Dispose of in accordance with all federal, state, and local regulations. The neutralized slurry can be scraped up for disposal in a RCRA approved waste facility. Porous material will absorb HF (concrete, wood, plastic, etc.) and become a hazard for an indefinite period of time.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Respiratory protection: NIOSH approved organic vapor respirators where adequate ventilation is not present. Wear self-contained breathing apparatus.

Ventilation: Where adequate ventilation is not available use NIOSH approved vapor respirator with dust, fume and mist filters. Local ventilation through fume hoods or laminar flow stations is also preferred.

Protective gloves: Skin contact should be avoided through use of gloves (Neoprene or PVC.)

Other protective equipment: Steel tipped shoes/eye wash station/chemical safety shower/ chemical retardant clothing.

Eye protection: Safety goggles / face shield. Do not wear contact lenses.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Storage and handling information. Store in cool dry place with adequate ventilation separated from other chemicals. Do not store near incompatible products or open flame. Storage facility should be constructed for containment and neutralization of spills. Store in tightly closed polyethylene bottles. This is a corrosive material, take care in handling leaking containers.

DOT CLASS:

AMMONIUM HYDROGEN FLUORIDE SOLUTION
CORROSIVE CLASS 8 UN 2817
SUB RISK 6.1

APPROVALS: M.E. Hecht

HYDROFLUORIC ACID

SKIN

1. Flush with water for several minutes until marble white appearance, due to acid, is replaced by a natural pinkish color. If color change is not rapid, then proceed with item #3.
2. Clothing should be removed as rapidly as possible, even while the victim is in the shower.
3. After thorough washing, the burned area should be immersed in a solution of 0.2% iced aqueous Hyamine 1622 or 0.13% iced aqueous Zephiran Chloride. If immersion is not practical, towels should be soaked with one of the above solutions and used as compress for the burned area. Ideally compresses should be changed every 2 minute..
4. Apply special Calcium Gluconate (2.5%) pasta.
5. If burn is severe, send to hospital.

EYES:

1. Wash the open eyes thoroughly with a 1arge, but gentle stream of water for 15 minutes.
2. Add two or three drops of 0.5% Pontocaine Solution and continue to wash with water until the eye stops sloughing, adding a couple drops of Pontocaine as needed.
3. Send to see Ophthalmologist-USE NO OILY EYE DROPS OR OINTMENT.

LUNGS:

1. Unconscious Patient
   a. While giving first aid treatment for inhalation of HF, treat the patient as above for skin burns.
   b. Give artificial respiration until inhalator is ready for use.
   c. Give nothing by mouth.
   d. Keep patient warm, but not hot.
   e. Keep patient resting flat.
   f. Send to hospital as soon as treatment of skin is completed.
   g. Send inhalator along with patient if respiration has not returned to normal.

2. Conscious Patient
   a. Keep patient resting flat.
   b. Discourage coughing, give cough syrup (in cabinet.)
   c. Keep patient warm, but not hot.
   d. Send to hospital after first aid treatment.
   e. Treat any skin burns he may tell you about at the same time the above treatment is being carried out.

ADDENDUM TO MATERIAL SAFETY DATA SHEET
REGULATORY STATUS

THIS ADDENDUM MUST NOT BE DETACHED
FROM THE MSDS ALUMINUM ETCH TYPE D
IDENTIFIES SARA 313 SUBSTANCE(S)

Any copying or redistribution of the MSDS must include a copy of this addendum
(Chem.Key:PHACD)

HAZARD CATEGORIES FOR SARA
Section 311/312 Reporting

Acute	Chronic	Fire	Pressure	Reactive
X	X			

Product or Components Of Products	SARA EHS Sect. 302		SARA Section 313 Chemicals		CERCLA Sec. 103	RCRA
	RQ (lbs.)	TPQ (lbs.)	Name List	Chemical Category	RQ (lbs.)	Section 261.33
BUFFERED OXIDE ETCH Following percentages correspond one to one with the product codes given here.						
Ammonium Fluoride (12125-01-8)	No	No	No	No	100	No
Hydrogen Fluoride (7664-39-3)	100	100	Yes	No	100	U134

SARA Section 302 EHS RQ: Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.
SARA Section 302 EHS TPQ: Threshold Planning Quantity of Extremely Hazardous Substance. An asterisk (*) following a hreshold Planning Quantity signifies that if the material is a solid and has a particle size equal to or larger than 100 micrometers, the Threshold Planning Quantity + 10,000 LBS.
SARA Section 313 Chemicals: Toxic Substances subject to annual release reporting requirements listed at 40 CFR 372.65.
CERCLA Sec 103: Comprehensive Enviromental Response, Compensation and Liability Act (Superfund). Releases to air, land or water of these hazardous substances which exceed the Reportable Quantity (RQ) must be reported to the National Response Center (800-424-8802); Listed at 40 CFR 302.4
RCRA: Resource Conservation and Reclamation Act. Commercial chemical product wastes designated as acute hazards and toxic under 40 CFR 261.33

Effective Date 09-01 Supersedes 01-01-85

BUFFERED OXIDE ETCH