

AWSM Industries, LLC
MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid 49 %

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Hydrofluoric Acid, 49%

OTHER/GENERIC NAMES: Hydrofluoric Acid, 49 % Aqueous, Aqueous HF, Hydrofluoric Acid Solution

PRODUCT CODES: ACH-38849-02

PRODUCT USE: Semi- conductor etching, cleaning agents, glass etching.

DISTRIBUTOR: AWSM Industries, LLC
12 Route 17 North, Suite 309
Paramus, NJ 07652

TELEPHONE: (201) 845-4666
(Monday-Friday, 8:30 AM – 5:00 PM)

CHEMTREC PHONE: 1800-424-9300
(24 Hours/Day, 7 Days/Week)

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME:</u>	<u>CAS NO.</u>	<u>% WT</u>
Hydrofluoric Acid	7664-39-3	49
Water	7732-18-5	51

Trace impurities and additional material names not listed above may also appear in Section 15 towards the end of the MSDS. These materials may be listed for local "Right-to-Know" compliance and for other reasons.

OSHA Hazard Communication Standard: *This product is considered hazardous under the OSHA Hazard Communication Standard*

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: A colorless, fuming liquid with a sharp, pungent odor. Causes severe burns to skin and eyes. May be fatal if inhaled or swallowed. Not flammable.

POTENTIAL HEALTH HAZARDS

SKIN: Both liquid and vapor can cause severe burns which may not be immediately painful or visible. HF will penetrate skin and attack underlying tissues and bone. Large burns (over 25 square inches) may also cause hypocalcaemia which, in rare instances, has been fatal. Special medical treatment is required to treat hydrofluoric acid burns. The effects may be delayed if initial first aid measures are inadequate. Dilute solutions of hydrofluoric acid (2 % or lower) can also cause burns.

EYES: Both liquid and vapor can cause irritation or corneal burns or conjunctivitis. Dilute solutions of hydrofluoric acid (2% or lower) can also cause burns.

INHALATION: Mild exposure: Can irritate nose, throat and respiratory system. Severe exposure: Can cause nose and throat burns, lung inflammation and pulmonary edema. Also depletes

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INGESTION: calcium levels in the body if not promptly treated, resulting in death due to hypocalcaemia.
Can cause severe mouth, throat and stomach burns. Can affect kidney function and be fatal if swallowed. Profound and possibly fatal hypocalcaemia is likely to occur unless medical treatment is promptly initiated.

DELAYED EFFECTS: Bone and joint changes in humans (fluorosis)

Ingredients found on one of the three OSHA designated carcinogen lists are listed below.

<u>INGREDIENT NAME</u>	<u>NTP STATUS</u>	<u>IARC STATUS</u>	<u>OSHA LIST</u>
No ingredients listed in this section			

SECTION 4: FIRST AID MEASURES

SKIN:

1. Remove the victim from the contaminated area and immediately place victim under a safety shower or wash victim with a water hose, whichever is available. Remove all contaminated clothing. Keep washing victim with large amounts of water for a minimum of 15-20 minutes. Pay particular attention to skin under the fingernails.
2. Have someone make arrangements for medical attention while you continue flushing the affected area with water.
3. If available, 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 compresses for the burned area. Ideally compresses should be changed every 2 minutes. At our plants, we generally keep 10-15 liters of solution made up available for use. Solutions are replaced annually if not used.*
4. An alternative treatment to # 3 is for the physician to inject sterile 10% aqueous calcium gluconate solution subcutaneously beneath, around, and in the burned area. Initially use no more than 0.5 cc per square centimeter and do not distort appearance of the skin. If pain is not completely relieved, additional treatment is indicated.
5. Seek medical attention as soon as possible for all burns, regardless of how minor they may appear initially.

*Hyamine® 1622 is a trade name for benzethonium chloride. Merck Index monograph 1072, a quaternary ammonium compound sold by Rohm and Haas, Philadelphia, PA. Zephiran Chloride® is a trade name for benzalkonium chloride, Merck Index monograph 1055, also a quaternary ammonium compound, sold by Winthrop laboratories, NYC.

EYES:

1. Flush the eyes immediately for 15-20 minutes with large amounts of water. Hold the eyelids open to allow thorough flushing of the eyes (use water only).
2. Get Medical attention immediately, preferably an eye specialist.
3. If a physician is not immediately available, apply 1-2 drops of a 0.5 % Pontocaine Hydrochloride solution followed by a second irrigation for 15 minutes. Do not use any of the solutions described for skin treatment. Use no oils or greases unless instructed to do so by a physician.*

*Pontocaine Hydrochloride is a trade name for Tetracaine Hydrochloride, Merck Index monograph 8904, sold by Winthrop laboratories, NYC.

INHALATION:

1. Remove victim immediately to fresh air. Keep patient lying down, quiet and warm.
2. Get immediate medical attention.
3. If breathing has stopped, apply artificial respiration.
4. Use oxygen if a qualified operator is present.
5. Do not give stimulants unless instructed to do so by a physician.

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6. Do not permit victim to become active for at least 24 hours. Victim should be examined by a physician and held under observation for at least this 24-hour period.

INGESTION:

1. Drink large amounts of water to dilute. Do not induce vomiting.
2. Several glasses of milk or several ounces of milk of magnesia may be given for their soothing effect.
3. Get medical attention immediately.

ADVICE TO PHYSICIAN: Severe systemic effects may occur from large skin burns, significant inhalation or ingestion. Monitor for hypocalcemia. Treat inhalation exposures as chemical pneumonia.

SECTION 5: FIRE-FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	Not flammable
FLASH POINT METHOD:	Not applicable
AUTOIGNITION TEMPERATURE:	Not applicable
UPPER FLAME LIMIT (volume % in air)	Not applicable
LOWER FLAME LIMIT (volume % in air)	Not applicable
FLAME PROPAGATION RATE (solids)	Not applicable
OSHA FLAMMABLE CLASS:	Not applicable

EXTINGUISHING MEDIA:

Use water or suitable agent for fires adjacent to non-leaking tanks or containers of HF. Do not use solid water streams near ruptured tanks or spills of HF. Acid reacts violently with water and can splatter acid onto personnel.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Reaction with certain metals generates flammable and potentially explosive hydrogen gas. Considerable heat is evolved when contacted with many substances. Heat increases pressure and may explode container. Will react violently with water.

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

Wear NIOSH-approved, self-contained breathing apparatus and full protective clothing. Use water spray to keep non-leaking, fire-exposed containers cool.

SECTION 6: ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (See section 8 for recommended personal protective equipment.)

Ventilate area of leak or spill. Collect material in suitable containers for disposal. Wear appropriate personal protective equipment

Spills and releases may have to be reported to Federal and/or local authorities. See section 15 regarding reporting requirements.

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SECTION 7: HANDLING AND STORAGE

IN CASE OF SPILL OR OTHER RELEASE: (See section 8 for recommended personal protective equipment.)
Wear full protective equipment as described in Section 8. Contain spills and cautiously dilute with a large excess of water. Neutralize carefully with alkali such as soda ash or lime. Provide good ventilation. Flush residue in accordance with applicable disposal regulations. Attempt to keep unneutralized products out of sewer. Any release to the environment of these products may be subject to Federal and/or State reporting requirements. Check with appropriate agencies.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

HEAVY HANDLING (e.g. cases of bottles/carboys/drums/pallets of cases/ tank trucks): Sufficient to reduce acid mists below permissible TLV levels. Packaging and unloading areas and open processing equipment may require mechanical exhaust systems.

SPECIALIZED HANDLING (e.g. bottles): Handling should be done in a closed ventilated system (e.g. exhausted hood). This must be of corrosion-resistant materials.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION:	<p>HEAVY HANDLING: For routine product use, wear acid-resistant jacket, trousers, boots, and gauntlet gloves. For increased protection, use supplied-air acid suit.</p> <p>SPECIALIZED HANDLING: As a minimum, acid resistant gloves (Neoprene or PVC). For leak or spill or other emergency, use full protective clothing as given in HEAVY HANDLING.</p>
EYE PROTECTION:	<p>HEAVY HANDLING: As a minimum, wear hard hat, chemical safety goggles, full-face plastic shield. Do not wear contact lenses. For increased protection, use supplied- air acid suit.</p> <p>SPECIALIZED HANDLING: As a minimum, safety glasses with non-perforated side shields. Add a face shield if pouring liquid. For leak or spill or other emergency, use chemical safety goggles and face shield. Do not wear contact lenses.</p>
RESPIRATORY PROTECTION	<p>HEAVY HANDLING: Where required, use a NIOSH- approved respirator for HF gas or mists, as applicable. Some exposure levels may require a NIOSH- approved, self-contained breathing apparatus or supplied-air respirator.</p> <p>SPECIALIZED HANDLING: Generally not required. For spill or leak or other emergency, use a NIOSH-approved respirator for HF as given in HEAVY HANDLING.</p>
ADDITIONAL RECOMMENDATIONS	Provide eyewash stations and quick-drench shower facilities convenient to the work area.

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EXPOSURE GUIDELINES:

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
Hydrofluoric Acid	3 ppm Ceiling (as F)	3 ppm TWA (as F)	mg (F)/ liter of urine 7 (post shift) 4 (pre-shift)

- ¹= Limit established by Industry standard.
²= Workplace Environmental Exposure Level (AIHA).
³= Biological Exposure Index (ACGIH).

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

None

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Colorless, fuming liquid.	
PHYSICAL STATE:	Liquid	
MOLECULAR WEIGHT:	20.01 (HF)	
CHEMICAL FORMULA:	HF (in aqueous solution)	
ODOR:	Sharp, pungent odor.	
SPECIFIC GRAVITY (H₂O = 1):	1.1 – 1.2	
SOLUBILITY IN WATER (weight %):	100	
pH:	Not determined, but strongly acidic.	
BOILING POINT:	103-110 °C	
MELTING POINT:	~-35 °C	
VAPOR PRESSURE:	(mm Hg at 20°C) 5%: ~0.08 (HF) 48 %: ~14 (HF) 52% : ~ 19 (HF)	
VAPOR DENSITY(air= 1.0):	2.21 @ 70 °F 1.97 @ 75 °F 1.76 @ 80 °F	
EVAPORATION RATE:	Not determined	COMPARED TO:
% VOLATILES:	Not determined.	
FLASH POINT:	Not flammable.	

(Flash point method and additional flammability data are found in Section 5.)

SECTION 10: STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):

Stable under normal conditions.

INCOMPATIBILITIES:

Glass, concrete and other silicon-bearing materials: yields silicon tetrafluoride gas. Pressure build-up from this process has been known to blow up glass containers.

Carbonates, sulfides, and cyanides: yields toxic gases: carbon dioxide, hydrogen sulfide, and hydrogen cyanide.

Alkalis, some oxides, fluorine and other water-reactive materials: causes strong exothermic reactions that can be violent.

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Common metals: yields hydrogen gas, a fire and explosive hazard and a reactive hazard.
Corrosive to many materials, including rubber, leather, and certain organic materials.

HAZARDOUS DECOMPOSITION PRODUCTS:

HF (gas and mist).

HAZARDOUS POLYMERIZATION:

Will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

LC_{Lo} (inhl-human): 50 ppm/30 min

LC₅₀ (inhl-rat): 1276 ppm/1 hr

LC₅₀ (inhl-mouse): 342 ppm/1 hr

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Effects of chronic exposure include systemic fluoride toxicity, osteosclerosis, and mottling of the teeth. Hypocalcemia, metabolic acidosis, pulmonary edema, and death can occur from high-level chronic exposure.

OTHER DATA:

None.

SECTION 12: ECOLOGICAL INFORMATION

60 ppm*/fish/lethal/fresh water (* = time period not specified)

SECTION 13: DISPOSAL CONSIDERATIONS

RCRA

Is the unused product a RCRA hazardous waste if discarded? Yes If yes, the RCRA ID number is: U134

OTHER DISPOSAL CONSIDERATIONS:

If permitted by regulations, material may be neutralized with alkali.

The information offered in section 13 is for the product as shipped. Use and/or alterations to the product such as Mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

SECTION 14: TRANSPORT INFORMATION

US DOT HAZARD CLASS:	8, 6.1 PG II
US DOT ID NUMBER:	UN1790
PROPER SHIPPING NAME:	Hydrofluoric acid, solution

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

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SECTION 15: REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

TSCA INVENTORY STATUS: All ingredients listed on the TSCA Inventory

OTHER TSCA ISSUES: None

SARA TITLE III/ CERCLA

"Reportable/ Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

<u>INGREDIENT NAME</u>	<u>SARA/CERCLA RQ (LB)</u>	<u>SARA EHS TPQ(LB)</u>
Hydrofluoric Acid	100	100

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center (800) 424-8803 and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: Immediate

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 "Toxic Chemicals" and may be subject to annual reporting requirements.

CAS numbers and weight percents are found in Section 2.

<u>INGREDIENT NAME</u>	<u>COMMENT</u>
Hydrofluoric Acid	None

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

<u>INGREDIENT NAME</u>	<u>WEIGHT%</u>	<u>COMMENT</u>
No ingredients listed in this section.		

ADDITIONAL REGULATORY INFORMATION:

None listed.

WHMIS CLASSIFICATION (CANADA):

E, D2B.

Classified in accordance with WHMIS Controlled Product regulations.

FOREIGN CHEMICAL CONTROL INVENTORY STATUS

All ingredients listed on Canada (DSL) and Europe (EINECS)

SECTION 16: OTHER INFORMATION

CURRENT ISSUE DATE: September 2005

PREVIOUS ISSUE DATE: JANUARY 1, 2005

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CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

New Format

OTHER INFORMATION:

All information, statements, data, advice and/or recommendations, including, without limitation, those relating to storage, loading/unloading, piping and transportation (collectively referred to herein as "information") are believed to be accurate and reliable. However, no representation or warranty, express or implied, is made as to its completeness, accuracy, fitness or a particular purpose or any other matter, including, including, without limitation, that the practice of application of any such information is free of patent infringement or other intellectual property misappropriation. AWSM Industries, LLC is not engaged in the business of providing technical, operational, engineering or safety information for a fee, and therefore, any such information provided herein has been furnished as an accommodation and without charge. All information provided herein is intended for use by persons having requisite knowledge, skill and experience in the chemical industry. AWSM Industries, LLC shall not be responsible or liable for the use, application or implementation of the information, provided herein, and all such information is to be used at the risk, and in the sole judgment and discretion, of such persons, their employees, advisors, and agents.

Date Created	Created By	Replaces	Area	Product/ Process	Special
9/27/05	JD	01/01/05	MSDS	HF 49%	SRE