AQUABOND Chemistry for Tomorrow SAFETY DATA SHEET

Hydrofluoric Acid 49%

SECTION 1: IDENTIFICATION

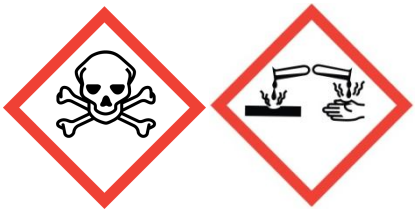
Product identifier used on a label:	**Hydrofluoric Acid 49%**
Product code:	2176
HS Code:	281111
Recommended use of the chemical and restrictions on use:	Manufacturing of chemicals. Etching and cleaning.
Chemical family:	Mixture.
Name, address and phone # of supplier:	Aqua Bond Inc. PO Box 63635, Toronto, ON, M1V 5K2 (416) 754-7211
24 Hr. Emergency phone #	**CANUTEC (613) 996-6666**

SECTION 2: HAZARDS IDENTIFICATION

Classification of the chemical: This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015).

Hazard classification:
CORROSIVE TO METALS: CATEGORY 1 – May be corrosive to metals.
ACUTE TOXICITY – ORAL: CATEGORY 2 – Fatal if swallowed.
ACUTE TOXICITY – DERMAL: CATGORY 1 – Fatal in contact with skin.
ACUTE TOXICITY – INHALATION: CATEGORY 2 – Fatal if inhaled.
SKIN CORROSION/IRRITATION: CATEGORY 1A – Causes severe skin burns and eye damage.
EYE DAMAGE/IRRITATION: CATEGORY 1 – Causes serious eye damage.
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE): CATEGORY 3 (Target organs – Respiratory system)–May cause respiratory irritation.

Label elements:



Signal word: Danger

Hazard statements:
H290: May be corrosive to metals.
H300: Fatal if swallowed.
H310: Fatal in contact with skin.
H330: Fatal if inhaled.
H314: Causes severe skin burns and eye damage.
H318: Causes serious eye damage.
H335: May cause respiratory irritation.

Precautionary statements:	**Prevention** P234: Keep only in original container. P260: Do not breathe dust/fume/gas/mist/vapours/spray. P262: Do not get in eyes, on skin, or on clothing. P264: Wash face, hands and any exposed skin thoroughly after handling. P270: Do not eat, drink or smoke when using this product. P271: Use only outdoors or in well-ventilated area. P280: Wear protective gloves/protective clothing/eye protection/face protection. P284: Wear respiratory protection. **Response** P390: Absorb spillage to prevent material damage. Ingestion: P301+P310: IF SWALLOWED: Immediately call a POISON CENTER of doctor/physician. P301+P330+P331: IF SWALLOWED: Rinse mouth. Do not induce vomiting. Skin: P302+P350: IF ON SKIN: Gently wash with plenty of soap and water. P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P310: Immediately call a POISON CENTER or doctor/physician. P361: Remove/Take off immediately all contaminated clothing. P363: Wash contaminated clothing before reuse. Inhalation: P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P310: Immediately call a POISON CENTER or doctor/physician. Eyes: P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310: Immediately call a POISON CENTER or doctor/physician. **Storage** P403+P233: Store in a well-ventilated place. Keep container tightly closed. P405: Store Locked up. P406: Store in corrosive resistant polypropylene container with a resistant inliner. **Disposal** P501: Dispose of contents/container in accordance with applicable regional, national and local laws and regulations.
Other hazards:	Not available.

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SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/ mixture: Mixture

Ingredient name	**CAS Number**	**Concentration (wt. %)**
Hydrogen Fluoride	7664-39-3	49%
Water	7732-18-5	51%

SECTION 4: FIRST-AID MEASURES

Description of first aid measures:

Ingestion	Fatal if swallowed. If swallowed, DO NOT induce vomiting, rinse mouth. Get medical attention immediately.
Inhalation	Remove to fresh air. If not breathing, give artificial respiration. Does not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention immediately.
Skin contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention immediately.
Eye contact	Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Get medical attention immediately.

Most important symptoms and effects, both acute and delayed:
Causes burns by all exposure routes. Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation.
Indication of any immediate medical attention and special treatment needed: Treat symptomatically.
Protection of first-aiders: First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media:

Suitable	Use water spray, alcohol-resistant foam, and dry chemical of carbon dioxide.
Unsuitable	Not available.
Flash point:	Not available.
Autoignition Temperature:	Not available.
Special hazards arising from the substance:	
Hazardous thermal decomposition products:	Thermal decomposition can lead to release of irritating gases and vapors.
Specific hazards:	The product causes burns of eyes, skin and mucous membranes.
Special protective actions for fire-fighters:	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can

	be done without risk. Use water spray to keep fire-exposed containers cool.
Special protective equipment for fire-fighters:	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment. Wear chemical goggles, body-covering protective clothing, chemical resistant gloves, and rubber boots. Keep combustibles (wood, paper, oil, clothing, etc.) away from spilled material. Avoid dust formation. Remove all sources of ignition. Do not get water inside containers. Do not expose spill to water.
Environmental precautions:	Should not be released into environment. Prevent from reaching drains, sewer, or waterway.
Methods and materials for containment and cleaning up:	Wear protective eyeware, gloves, and clothing. Refer to Section 8. Always obey local regulations. Containerize for disposal. Refer to Section 13. If necessary use trained response staff or contractor. Evacuate personnel to safe areas. Soak up with inert absorbent material. Keep in suitable closed containers for disposal.
Special spill response procedures:	In case of transportation accident, contact CANUTEC (613) 996-6666.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling:	Put on appropriate personal protective equipment. Avoid exposure – obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Do not reuse container.
Conditions for safe storage:	Store in accordance with local regulations. Store in a segregated and approved area. Store protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials, food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be resealed and kept upright. Do not store in unlabeled containers.
Incompatible materials:	Metals. Cyanides, Sulfides. Bases. Fluorine.

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SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters:

Exposure limits

Ingredient	**Exposure limits**
Hydrogen Fluoride	OSHA Permissible Exposure Limit (PEL) – 3 ppm (TWA) ACGIH Threshold Limit Value (TLV) – 3 ppm Ceiling as F
Engineering controls:	Use with adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Individual protection measures:	Eyes/face: Chemical splash goggles and face shield. Skin: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Respiratory: Wear appropriate respirator where spray mist occurs. Be sure to use a NIOSH approved dust and mist respirator or equivalent. Hygiene measures: Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Colorless, fuming liquid.
Odor:	Acrid odor – do not breathe fumes.
Odor threshold:	Not available.
pH:	1.0 (1M aqueous solution)
Melting point:	-36°C (-33°F)
Freezing point:	Not available.
Initial boiling point and boiling range:	108°C (226°F)
Flash point:	Not available.
Evaporation rate:	Not available.
Flammability:	Not applicable.
Upper and lower flammability limits:	Not available.
Vapour pressure:	33.3 hPa
Vapour density (Air=1):	1.97
Relative density:	1.18
Solubility:	Miscible with water
Partition coefficient n-octanol/water:	Not available.
Auto-ignition temperature:	Not available.
Decomposition temperature:	Not available.
Viscosity:	1.4 cPs

SECTION 10: STABILITY AND REACTIVITY

Reactivity:	Stable at room temperature when stored and use under proper conditions.
Chemical stability:	Stable.
Possibility of hazardous reactions:	Corrosive to metals. Contact with metals may evolve flammable hydrogen gas.
Conditions to avoid:	Exposure to moisture. Incompatible materials. Excess heat.
Incompatible materials:	Metals. Cyanides, Sulfides. Bases. Fluorine.
Hazardous decomposition products:	Gaseous hydrogen fluoride (HF)

SECTION 11: TOXICOLOGICAL INFORMATION

Toxicity data:	LC50 Rat Inhalation: 1278 mg/L/1h – Hydrogen fluoride LC50 Mouse Inhalation: 500 mg/L/1h – Hydrogen fluoride
Information on the likely routes of exposure:	Skin and Eyes: yes Inhalation: yes Ingestion: yes
Potential health effects (acute):	Causes burns by all exposure routes. Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation.
Delayed and immediate effects, chronic effects from short and long term exposure:	None known.
Potential chronic health effects:	None known.
Carcinogenicity:	Not listed as a carcinogen.
Mutagenicity:	No known significant effects or critical hazards.
Teratogenicity:	No known significant effects or critical hazards.
Developmental effects:	No known significant effects or critical hazards.
Fertility effects:	No known significant effects or critical hazards.
Sensitization:	No known significant effects or critical hazards.
Toxicological effects:	No known significant effects or critical hazards.
Acute toxicity:	No known significant effects or critical hazards.
Irritation/corrosion:	Causes burns by all exposure routes.

Specific target organ toxicity single exposure: May cause respiratory irritation.
Specific target organ toxicity repeated exposure: Not classified.
Aspiration hazard: Not classified.

SECTION 12 ECOLOGICAL INFORMATION

Toxicity (7664-39-3):	Freshwater Fish: LC50 Leucisucusidus: 660 mg/L/48h Water Flea: EC50 Daphnia species: 270 mg/L/48h

Persistence and degradability: Expected to be biodegradable.
Bioaccumulative potential: Not available.
Mobility in soil: Will likely be mobile in the environment due to water solubility.

SECTION 13: DISPOSAL CONSIDERATIONS

Disposal methods: The generation of waste should be avoided or minimized wherever possible.
Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and nonrecyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: TRANSPORT INFORMATION

	TDG
UN Number:	UN 1790
UN proper shipping name:	HYDROFLUORIC ACID
Transport hazard class:	8, 6.1
Packing group:	II
Environmental hazard:	No data available.
Special precautions for user:	**Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident.

SECTION 15: REGULATORY INFORMATION

United States

Toxic Substances Control Act (TSCA)	All components are listed.
Superfund Amendments and Reauthorization Acts	Section 302, Section 311/312, Section 313

Canada

Canadian Domestic Substances List (DSL):	All components are listed.

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SECTION 16: OTHER INFORMATION

Revision date: November 2, 2022

UN = United Nations

Disclaimer

While the information and recommendations set forth are believed to be accurate as of data hereof, Aqua Bond Inc., makes no warranty with respect thereto and disclaims all liability from reliance thereon.