COLUMBUS CHEMICAL INDUSTRIES

Safety Data Sheet

Hydrofluoric Acid, 48%, ACS

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Hydrofluoric Acid, 48%, ACS

Synonyms/Generic Names: Hydrogen fluoride, Fluoric acid, Fluorhydric acid, Fluorine hydride

Product Number: 2630

Product Use: Industrial, Manufacturing or Laboratory use

Manufacturer: Columbus Chemical Industries, Inc.
N4335 Temkin Rd.
Columbus, WI. 53925

For More Information: 920-623-2140 (Monday-Friday 8:00-4:30)
www.columbuschemical.com

In Case of Emergency Call: CHEMTREC - 800-424-9300 or 703-527-3887 (24 Hours/Day, 7 Days/Week)

2. HAZARDS INDENTIFICATION

Hazard Not Otherwise Classified (HNOC): None

Signal Words: Danger

Pictograms:

GHS Classification:

Acute toxicity, Oral	Category 2
Acute toxicity, Inhalation	Category 2
Acute toxicity, Dermal	Category 1
Skin corrosion	Category 1A
Serious eye damage	Category 1

GHS Label Elements, including precautionary statements:

Hazard Statements:

H300+H310+H330	Fatal if swallowed, if inhaled or in contact with skin.
H314	Causes severe skin burns and eye damage.

Precautionary Statements:

P260	Do not breathe fume/gas/mist/vapors/spray.
P262	Do not get in eyes, on skin, or on clothing.
P264	Wash hands thoroughly after handling.

P270	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P284	In case of inadequate ventilation, wear respiratory protection.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do not induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
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/doctor/physician.
P361+P364	Take off immediately all contaminated clothing and wash it before reuse.
P363	Wash contaminated clothing before reuse.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local regulations.

Potential Health Effects

Eyes	Causes severe eye burns.
Inhalation	Toxic if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Skin	May be fatal if absorbed through skin. Causes skin burns.
Ingestion	May be fatal if swallowed.

NFPA Ratings

Health	4
Flammability	0
Reactivity	1
Specific hazard	Not Available

HMIS Ratings

Health	3
Fire	0
Reactivity	1

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Weight %	CAS #	EINECS# / ELINCS#	Formula	Molecular Weight
Hydrofluoric Acid	47-49	7664-39-3	231-634-8	HF	20.01 g/mol
Water	Balance	7732-18-5	231-791-2	H_2O	18.00 g/mol

4. FIRST-AID MEASURES

Eyes	Immediately rinse with plenty of water for at least 15 minutes and seek medical attention immediately. Cold water may be used. Keep the eyelids apart and away from the eyeballs during irrigation. Do not use oily drops or ointment or HF skin burn treatments on the eyes. Get medical attention immediately, preferably an eye specialist. Place ice pack on eyes until reaching emergency room.
Inhalation	Move casualty to fresh air and keep at rest. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.
Skin	Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cold water may be used. Material is absorbed through the skin. Get medical attention immediately. While waiting for medical attention, it has been shown that flushing the affected area with water for one minute and then massaging HF Antidote Gel into the wound until there is a cessation of pain is a most effective first aid treatment. HF Antidote Gel contains Calcium Gluconate which combines with HF for

	insoluble Calcium Fluoride, thus preventing the extraction of calcium from the body tissue and bones. Another alternative first aid treatment, after thorough washing of the burned area, is to immerse the burned area in a solution of 0.2% iced aqueous Hyamine 1622 or 0.13% iced aqueous Zephiran Chloride. If immersion is impractical, towels could be soaked with one of the above solutions and used as compresses for the burn area. Hyamine 1622 is a trade name for Tetracaine Benzethonium Chloride. Zephiran is a trade name for Benzalkonium Chloride.
Ingestion	**Do Not Induce Vomiting!** Never give anything by mouth to an unconscious person. If conscious, wash out mouth with water. Get medical attention immediately.

5. FIRE-FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media	Product is not flammable. Use appropriate media for adjacent fire. Cool containers with water, keep away from common metals.
Special protective equipment and precautions for firefighters	Wear self-contained, approved breathing apparatus and full protective clothing, including eye protection and boots. Material can react violently with water (spattering and misting) and react with metals to produce flammable hydrogen gas.
Specific hazards arising from the chemical	Emits toxic fumes (hydrogen fluoride) under fire conditions. (See also Stability and Reactivity section).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	See section 8 for recommendations on the use of personal protective equipment.
Environmental precautions	Prevent spillage from entering drains. Any release to the environment may be subject to federal/national or local reporting requirements.
Methods and materials for containment and cleaning up	Neutralize spill with sodium bicarbonate or lime. Absorb spill with noncombustible absorbent material, then place in a suitable container for disposal. Clean surfaces thoroughly with water to remove residual contamination. Dispose of all waste and cleanup materials in accordance with regulations.

7. HANDLING AND STORAGE

Precautions for safe handling
See section 8 for recommendations on the use of personal protective equipment. Use with adequate ventilation. Wash thoroughly after using. Keep container closed when not in use. Avoid formation of aerosols.

Conditions for safe storage, including any incompatibilities
Store in a cool, dry, well ventilated area. Do not store in glass for prolonged periods of time. Keep away from incompatible materials (see section 10 for incompatibilities).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure controls:

Component	Exposure Limits	Basis	Entity
Hydrofluoric Acid	0.5 ppm 0.41 mg/m^3	TLV	ACGIH
	2 ppm	CEIL	ACGIH

	1.64 mg/m^3		
	3 ppm	PEL	OSHA
	3 ppm 2.5 mg/m^3	REL	NIOSH
	6 ppm 5 mg/m^3	CEIL	NIOSH

TWA: Time Weighted Average over 8 hours of work.
TLV: Threshold Limit Value over 8 hours of work.
REL: Recommended Exposure Limit
PEL: Permissible Exposure Limit
STEL: Short Term Exposure Limit during x minutes.
IDLH: Immediately Dangerous to Life or Health
WEEL: Workplace Environmental Exposure Levels
CEIL: Ceiling

Personal Protection

Eyes	Wear chemical safety glasses or goggles, and face shield.
Inhalation	Provide local exhaust, preferably mechanical. If exposure levels are excessive, use an approved respirator.
Skin	Wear nitrile or rubber gloves, and full body (synthetic) covering.
Other	Not Available

Other Recommendations

Provide eyewash stations, quick-drench showers and washing facilities accessible to areas of use and handling. Have supplies and equipment for neutralization and running water available. HF antidote gel for skin burns or other solutions discussed in Section 4, First Aid.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.)	Clear, colorless liquid
Odor	Acrid, suffocating odor
Odor threshold	0.5 - 3 ppm
pH	1
Melting point/freezing point	Not Available
Initial boiling point and boiling range	Not Available
Flash point	Not Flammable
Evaporation rate	Not Available
Flammability (solid, gas)	Not Flammable
Upper/lower flammability or explosive limit	Not Explosive
Vapor pressure	Not Available
Vapor density	Not Available
Relative density	1.16-1.18
Solubility (ies)	Completely soluble in water
Partition coefficient: n-octanol/water	Not Available
Auto-ignition temperature	Not Available
Decomposition temperature	Not Available

10. STABILITY AND REACTIVITY

Chemical Stability	Stable
Possibility of Hazardous Reactions	Will not occur.
Conditions to Avoid	Uncontrolled addition of water.
Incompatible Materials	Moisture, bases, organic material, metals, glass, ceramics, aluminum, stainless steel, carbonates, cyanides, sulfides. Reacts violently with acetic anhydride, ammonium hydroxide,

	arsenic trioxide, calcium oxide, potassium permanganate, sodium, sodium hydroxide, sulfuric acid.
Hazardous Decomposition Products	Hydrogen fluoride.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Hydrofluoric Acid

Skin	Not Available
Eyes	Not Available
Respiratory	LC50- rat- 1 hour: 2240-2340 ppm
Ingestion	LD100- guinea pig– 80 mg/kg

Carcinogenicity

IARC	No components of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH	No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP	No components of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA	No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Signs & Symptoms of Exposure

Eyes	Direct contact with hydrofluoric acid can cause severe and irreversible corrosive injury with possible corneal scarring and blindness. The acid penetrates to deep tissue layers and causes severe corrosive injury.
Inhalation	May be fatal if inhaled. Low concentrations can cause irritation of the nose, throat, eyes and respiratory tract. Higher concentrations can cause severe burns to the throat, airways and lungs. Fluid accumulation in the lungs and irregular heartbeat has led to deaths within hours following inhalation and, in some cases, concurrent skin contact with unknown concentrations of HF. Within 24-48 hours, the victim may experience a rapidly worsening difficulty in breathing, accompanied by coughing and pulmonary edema. Severe short-term exposures may result in long- lasting effects such as shortness of breath and pulmonary emphysema.
Skin	May be fatal if absorbed through skin and penetration may continue for several days. Hydrofluoric acid is extremely corrosive and can cause very deep and excruciatingly painful burns and tissue loss. Burns are swollen, hot and painful, then develop white or yellowish areas and blistering, with deep ulceration and destruction of tissue, which tends to heal slowly. The severity of the burns and absorption of the acid (with liquefaction necrosis of soft tissue and decalcification and corrosion of the bone) have resulted in permanent scarring, disability and death. Burns from concentrated solutions (greater than 50%) are felt immediately and tissue destruction is readily apparent. Weaker solutions (20-50%) result in burns that are apparent after several hours. Burns from solutions of less than 20% may take up to 24 hours to become apparent. Weak solutions (less than 7%) penetrate deeply before causing tissue damage and surface involvement may be minimal.
Ingestion	May be fatal if swallowed. Hydrofluoric acid is corrosive and can cause severe burning of the mouth, throat and stomach. Perforation of the digestive system may occur. Systemic fluoride toxicity has occurred following ingestion. Symptoms such as nausea, vomiting, abdominal pain, reduced heartbeat and blood pressure, shortness of breath have been reported. In some cases, death occurred in less than one hour following ingestion. Ingestion is not a typical route of occupational exposure.

Chronic Toxicity	Absorbed fluoride can cause metabolic imbalances with irregular heartbeat, central nervous system depression, seizures, and deaths.

	Long-term exposure may cause osteofluorosis (weakened bone structure), skin disorders, and respiratory, liver and kidney effects.
Teratogenicity	Not available
Mutagenicity	May cause genetic effects based on animal data.
Embryotoxicity	May cause fetal toxicity based on animal data.
Target Organ(s)	Liver, Kidney
Reproductive Toxicity	Not Available
Respiratory/Skin Sensitization	Not Available

12. ECOLOGICAL INFORMATION

Ecotoxicity
Hydrofluoric Acid

Aquatic Vertebrate	Aquatic fish; EC50 (48 hours): 270 mg/l
Aquatic Invertebrate	Not Available
Terrestrial	Not Available

Persistence and Degradability	Not Available
Bioaccumulative Potential	Not Available
Mobility in Soil	Not Available
PBT and vPvB Assessment	Not Available
Other Adverse Effects	Not Available
Reproductive Toxicity	Not Available
Respiratory/Skin Sensitization	Not Available

13. DISPOSAL CONSIDERATIONS

Waste Product or Residues	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product or residue.
Product Containers	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product container.

The information offered in section 13 is for the product as shipped. Use and/or alterations to the product may significantly change the characteristics of the material and alter the waste classification and proper disposal methods.

14. TRANSPORTATION INFORMATION

US DOT	UN1790, Hydrofluoric Acid, 8 (6.1), pg II
TDG	UN1790, HYDROFLUORIC ACID, 8 (6.1), PG II
IMDG	UN1790, HYDROFLUORIC ACID, 8 (6.1), PG II
Marine Pollutant	No
IATA/ICAO	UN1790, Hydrofluoric Acid, 8 (6.1), pg II

15. REGULATORY INFORMATION

TSCA Inventory Status	All ingredients are listed on the TSCA Active inventory.
DSL / NDSL	All ingredients are listed on the DSL inventory.

California Proposition 65	Not Listed
Rhode Island: Hazardous Substance List	Listed: Hydrofluoric Acid
Massachusetts: Toxic or Hazardous Substance List, Right to Know	Listed: Hydrofluoric Acid
Pennsylvania: Hazardous Substance List	Listed: Hydrofluoric Acid
New Jersey: Right to Know Hazardous Substance List	Listed: Hydrofluoric Acid
SARA 302	Listed: Hydrofluoric Acid
SARA 304	Listed: Hydrofluoric Acid
SARA 311	Acute Health Hazard.
SARA 312	Acute Health Hazard.
SARA 313	Listed: Hydrofluoric Acid
WHMIS Canada	Class D1A: Poisonous and infectious material – Immediate and serious effects – Very toxic. Class D2A: Poisonous and infectious material – Other effects – Very toxic. Class E: Corrosive material.

16. OTHER INFORMATION

Revision	Date
Original	08/11/2011
Revision 1	10/16/2013
Revision 2	04/08/2015
Revision 3	12/10/2018
Revision 4	02/28/2022

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