

Material Safety Data Sheets

1. IDENTIFICATION

Product Name	Hydrofluoric acid 48-51 %
Other Names	HYDROFLUORIC ACID, with not more than 60% hydrogen fluoride; Hydrogen fluoride, aqueous solution
Uses	Chemical intermediate, etching and polishing of glass and pottery, cleaning of metals, mineral extraction.
Chemical Family	No Data Available
Chemical Formula	HF.H ₂ O
Chemical Name	Hydrofluoric acid, aqueous solution
Product Description	No Data Available
Company	Arman sina.co
Contact Information	info@armansina.com www.armansina.com

2. HAZARD IDENTIFICATION

Hazard Categories		Acute Toxicity (Oral) - Category 2 Acute Toxicity (Dermal) - Category 1 Acute Toxicity (Inhalation) - Category 2 Skin Corrosion/Irritation - Category 1A Serious Eye Damage/Irritation - Category 1
Signal Word		Danger
Hazard Statements		H300 + H310 + H330 Fatal if swallowed, in contact with skin or if inhaled. H314 Causes severe skin burns and eye damage.
Precautionary Statements	Prevention	P262 Do not get in eyes, on skin, or on clothing.
		P280 Wear protective gloves/protective clothing/eye protection/face protection.
		P260 Do not breathe mist/vapours.
		P284 Wear respiratory protection.
		P270 Do not eat, drink or smoke when using this product.
		P271 Use only outdoors or in a well-ventilated area.
	Response	P310 Immediately call a POISON CENTER or doctor.
		P304 + P340 IF INHALED: Remove victim to fresh air and keep comfortable for breathing.
		P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
		P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P363 Wash contaminated clothing before reuse.
	Storage	P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
		P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
	Disposal	P405 Store locked up.
		P501 Dispose of contents/container in accordance with local / regional / national / international regulations.

Symbol



3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Hydrofluoric Acid	HF	7664-39-3	48-51 %
Water	No Data Available	7732-18-5	Balance %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	IF SWALLOWED: Immediately call a Poison Centre or doctor/physician. Do NOT induce vomiting. Give copious quantities of milk, water drinks, milk of magnesia, antacid (e.g. Mylanta) or effervescent calcium gluconate tablets dissolved in water (in spite of vomiting). If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Rinse mouth of victim thoroughly with water and spit out rinse water. Never give anything by mouth if victim is losing consciousness, is unconscious or convulsing. Keep victim calm and warm - Obtain immediate medical care. Transport to hospital by ambulance.
Eye	IF IN EYES: Immediately call a Poison Centre or doctor/physician. Flush eye(s) continuously with running water or copious isotonic saline for several minutes, holding the eyelids open and occasionally lifting the upper and lower lids. Take care not to rinse contaminated water into a non-affected eye. Carefully remove contact lenses if present and easy to do. Continue flushing until advised to stop by a Poisons Information Centre or a doctor, or for at least 15 minutes. Transport to hospital by ambulance; Continue eye irrigation during transport to hospital. An ophthalmologist should always be consulted, as severe corneal damage is possible. Contact with eyes, even for short periods, can cause blindness. - If available, use Hexafluorine eyewash within the first minute of exposure and continue washing until arrival at hospital.
Skin	IF ON SKIN: Immediately call a Poison Centre or doctor/physician. Flush contaminated skin gently with running water for several minutes. In case of gross contamination, drench contaminated clothing and skin with plenty of water before removing clothes and footwear. For minor skin contact, avoid spreading material on unaffected skin. Isolate contaminated clothing by sealing in a bag or other container. Wearing clean protective gloves, gently massage Calcium gluconate gel into and around the affected area. If gel is not readily available, continue flushing with water. Transport to hospital by ambulance; Continue application of gel during transport to hospital and for at least 15 minutes after the pain has subsided (this treatment may be required for several hours). Wear clean gloves when applying gel. - If available, use Hexafluorine body wash within the first minute of exposure and continue washing until arrival at hospital.
Inhaled	IF INHALED: Immediately call a Poison Centre or doctor/physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. Apply resuscitation if victim is not breathing - Do not use direct mouth-to-mouth method if victim ingested or inhaled the substance; use alternative respiratory method or proper respiratory device; Administer oxygen if breathing is difficult. Keep victim calm and warm - Obtain immediate medical care. Transport to hospital by ambulance; Continue observation for at least 48 hours due to the danger of pulmonary oedema.
Advice to Doctor	This SDS should accompany the affected person to hospital. Hydrofluoric acid penetrates rapidly and deeply below fat layers binding and depleting tissue calcium. Failure to commence the correct medical treatment promptly may be fatal. Intensive care unit facilities are likely to be needed. Delayed pulmonary oedema is likely with burns to the face or neck. A skin burn involving more than 1 % of body area with 50 % or more concentration of Hydrofluoric acid, or more than 5 % of body area with any lesser concentrations, may be associated with systemic effects. Skin burns may become necrotic and gangrenous and damaged area may spread. Treatment with intravenous Calcium gluconate should commence immediately. Inhalation may lead to chemical pneumonitis, haemorrhagic pulmonary oedema or laryngeal oedema and may be fatal. Be prepared to intubate or perform tracheotomy.
Medical Conditions Aggravated by Exposure	No information available.

5. FIRE FIGHTING MEASURES

General Measures	If safe to do so, move undamaged containers from fire area. Cool containers with flooding quantities of water until
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	well after fire is out. Avoid getting water inside containers.
Flammability Conditions	Non-combustible; Does not burn.
Extinguishing Media	Use dry chemical, Carbon dioxide (CO ₂), dry sand or flooding quantities of water for extinction. Large fire: Flood fire area with large quantities of water while knocking down vapours with water fog - If insufficient water supply, knock down vapours only.
Fire and Explosion Hazard	Contact with metals may evolve flammable hydrogen gas. Reaction with water may generate heat which will increase the concentration of fumes in the air and present risk of splashing. Containers may explode when heated or contaminated with water. Vapours may accumulate in confined areas. Inhalation, ingestion or contact with substance may cause severe injury or death.
Hazardous Products of Combustion	Fire will produce toxic and corrosive gases, including Hydrogen fluoride.
Special Fire Fighting Instructions	Contain runoff from fire control or dilution water - Runoff may be toxic and/or corrosive and pollute waterways.
Personal Protective Equipment	Liquid-tight chemical protective clothing (splash suit) in combination with self-contained breathing apparatus (SCBA) should be used. Structural firefighter's uniform is NOT effective for this material.
Flash Point	No Data Available
Lower Explosion Limit	No Data Available
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	2X

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation - Ventilate enclosed spaces before entering. ELIMINATE all ignition sources. Do not touch or walk through spilled material. Inhalation, ingestion or contact with substance may cause severe injury or death - Do not breathe vapours and prevent contact with eyes, skin and clothing. Large spill: Immediately contact Police or Fire Brigade.
Clean Up Procedures	Take up with liquid-absorbent and neutralising material and transfer to a suitable container for disposal (see SECTION 13).
Containment	Stop leak if safe to do so - Prevent entry into waterways, drains or confined areas. Vapour-suppressing foam may be used to control vapours; Water spray may be used to knock down or divert vapour clouds.
Decontamination	Neutralise HF with calcium hydroxide or lime or HF absorbent (e.g. Chemisorb HF). Contaminated clothing should be washed with bicarbonate of soda solution. Contaminated equipment or surfaces can be neutralised with calcium hydroxide or slaked lime, before being washed with water.
Environmental Precautionary Measures	Spillages and decontamination runoff should be prevented from entering drains and watercourses.
Evacuation Criteria	Spill or leak area should be isolated immediately. Keep unauthorised personnel away. Keep upwind and to higher ground. Large spill: Consider downwind evacuation of areas.
Personal Precautionary Measures	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing (see SECTION 8). Wear self-contained breathing apparatus (SCBA) and chemical splash suit. Structural firefighter's uniform is NOT effective for this material.

7. HANDLING AND STORAGE

Handling	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation - Use only outdoors or in a well-ventilated area. HIGHLY CORROSIVE: Handle with extreme care and in accordance with good industrial hygiene and safety practice. Avoid generation of mist/vapours/aerosols. Do not breathe mist/vapours/aerosols. Do not get in eyes, on skin or on clothing. Do not ingest. Do not handle unless wearing appropriate protective clothing (see SECTION 8). Keep away from heat and all sources of ignition - No smoking. Use explosion-proof electrical/ventilating/lighting equipment.
Storage	Store in a cool, dry and well-ventilated place. Keep container tightly closed. Keep away from heat and all sources of ignition - No smoking. Keep away from foodstuffs and incompatible materials (see SECTION 10). Store locked up.
Container	Store HF in the original or plastic (polyethylene, polypropylene or PVC) containers only. Do not store in metal (steel, copper, aluminium) or glass containers.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	COMPONENT: Hydrogen fluoride (CAS No. 7664-39-3): - Safe Work Australia Exposure Standard (as F): TWA = 3 ppm (2.6 mg/m³) Peak limitation. - New Zealand WES (as F): TWA = 3 ppm (2.6 mg/m³) Ceiling. - NIOSH REL: TWA = 3 ppm (2.5 mg/m³); 6 ppm (5 mg/m³) 15-minute Ceiling. - OSHA PEL: TWA = 3 ppm. - Immediately dangerous to life or health (IDLH) concentration: 30 ppm.
Exposure Limits	No Data Available
Biological Limits	No information available.
Engineering Measures	All HF work involving the release of HF should be conducted in a scrubbed fume cupboard. The occupational exposure limit value should not be exceeded during any part of the working exposure.
Personal Protection Equipment	- Respiratory protection: Wear respiratory protection. Recommended: Filter type E-P3 or HF when mist/vapours/aerosols are generated. - Eye/face protection: Wear appropriate eye protection to prevent eye contact when mixing or using. Recommended: Tightly fitting safety goggles; Face shield. - Hand protection: Wear protective gloves when mixing or using. Recommended: For splash contact only, polychloroprene gloves (0.65 mm), Break through time: 240 min. For full contact, butyl rubber gloves (0.7 mm), Break through time: 480 min. Wash gloves thoroughly, immediately after use. - Skin/body protection: Wear appropriate personal protective clothing to prevent skin contact. Recommended: Acid-resistant protective clothing; rubber or plastic boots.
Special Hazards Precautions	HF should only be handled by workers who have been adequately trained and assessed as competent in its use. Do not work alone with HF. Specific treatment is necessary in case of poisoning with this substance; the appropriate means with instructions must be available. Ensure that a first aid kit has the necessary content, is kept up to date and is complete to adequately respond to potential HF exposure. Obtain a supply of calcium gluconate gel.
Work Hygienic Practices	Do not eat, drink or smoke when using this product. Do not get in eyes, on skin or on clothing. Wash hands and face thoroughly after handling. Remove/take off immediately all contaminated clothing. Isolate contaminated clothing by sealing in a bag or other container. Decontaminate and wash contaminated clothing and protective equipment before storage or reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Appearance	Liquid
Odour	Sharp, pungent
Colour	Colourless
pH	<3.4 50-60%
Vapour Pressure	101 hPa at 50 °C(122 °F)
Relative Vapour Density	No Data Available
Boiling Point	>87.8 - 106 ° C
Melting Point	No Data Available
Freezing Point	-35 - -40 ° C
Solubility	Miscible with water
Specific Gravity	>1.15 - <1.2
Flash Point	No Data Available
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	No Data Available
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available

Octanol Water Coefficient	No Data Available
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	No Data Available
VOC Volume	No Data Available
Additional Characteristics	No information available.
Potential for Dust Explosion	Not applicable.
Fast or Intensely Burning Characteristics	No information available.
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a splashing. Fire	Reaction with water may generate heat which will increase the concentration of fumes in the air and present risk of
Properties That May Initiate or Contribute to Fire Intensity	Non-combustible; Does not burn; However, many reactions may cause fire or explosion.
Reactions That Release Gases or Vapours	Reacts violently with many compounds. producing toxic and corrosive gases, including Hydrogen fluoride.
Release of Invisible Flammable Vapours and Gases	Reacts violently with bases and is corrosive to most common metals forming flammable/explosive Hydrogen gas.

10. STABILITY AND REACTIVITY

General Information	The substance is a weak acid. Reacts violently with many compounds, generating fire and explosion hazard. It reacts violently with bases and is corrosive to most common metals. Attacks glass, some forms of plastic, rubber and coatings.
Chemical Stability	Material is stable under normal conditions of temperature and pressure.
Conditions to Avoid	Avoid generation of mist/vapours/aerosols. Keep away from heat and all sources of ignition.
Materials to Avoid	Incompatible/reactive with alkali metals, fluorine, organic substances, vinyl acetate; potassium permanganate, alkali hydroxides, strong alkalis, fluorides, potassium, metals, sodium, methanesulfonic acid; nitric acid, with, glycerol; acetic anhydride, ammonia, ammonium hydroxide, sodium hydroxide, fuming sulfuric acid, oxides of phosphorus, silicon compounds, sulphuric acid, bismuth acid, ethanolamine.
Hazardous Decomposition Products	Reacts violently with many compounds. producing toxic and corrosive gases, including Hydrogen gas, Hydrogen fluoride.
Hazardous Polymerisation	No information available.

11. TOXICOLOGICAL INFORMATION

General Information	- Acute toxicity: Fatal if swallowed, in contact with skin and if inhaled. Ingestion or inhalation may cause burns in mouth and throat, burning sensation, cough, laboured breathing, shortness of breath, abdominal pain, vomiting, shock or collapse. Symptoms may be delayed. - Skin corrosion/irritation: Causes severe skin burns, redness, pain, blisters. Hydrofluoric acid penetrates rapidly and deeply below fat layers binding and depleting tissue calcium. - Eye damage/irritation: Causes serious eye damage, redness, pain, severe burns. - Respiratory/skin sensitisation: No information available. - Germ cell mutagenicity: No information available. - Carcinogenicity: No information available. - Reproductive toxicity: No information available. - STOT (single exposure): Mist/vapours are corrosive to the respiratory tract. - STOT (repeated exposure): May cause bone and teeth damage, skin ulcers, irritation of the nose, throat and bronchi. - Aspiration toxicity: No information available. None
Carcinogen Category	None

12. ECOLOGICAL INFORMATION

Ecotoxicity	No information available.
Persistence/Degradability	No information available.
Mobility	No information available.
Environmental Fate	Avoid release to the environment. Endangers drinking-water supplies if allowed to enter soil or water. Harmful effect due to pH shift.
Bioaccumulation Potential	No information available.
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of contents/container in accordance with local/regional/national regulations.
Special Precautions for Land Fill	Leave chemicals in original containers; No mixing with other waste. Handle uncleaned containers like the product itself.

14. TRANSPORT INFORMATION

Land Transport

Proper Shipping Name	HYDROFLUORIC ACID, with not more than 60% hydrogen fluoride
Class	8 Corrosive Substances
Subsidiary Risk(s)	6.1 Toxic and Infectious Substances - Toxic Substances
ERG	157 Substances - Toxic and/or Corrosive (Non-Combustible / Water-Sensitive)
UN Number	1790
Hazchem	2X
Pack Group	II
Special Provision	No Data Available

Sea Transport

Proper Shipping Name	HYDROFLUORIC ACID, with not more than 60% hydrogen fluoride
Class	8 Corrosive Substances
Subsidiary Risk(s)	6.1 Toxic and Infectious Substances - Toxic Substances
UN Number	1790
Hazchem	2X
Pack Group	II
Special Provision	No Data Available
EMS	F-A, S-B
Marine Pollutant	No

Air Transport

Proper Shipping Name	Hydrofluoric acid 60% or less hydrogen fluoride
Class	8 Corrosive Substances
Subsidiary Risk(s)	6.1 Toxic and Infectious Substances - Toxic Substances
UN Number	1790
Hazchem	2X
Pack Group	II
Special Provision	No Data Available

15. OTHER INFORMATION

Revision	2
Key/Legend	< Less Than > Greater Than AICS Australian Inventory of Chemical Substances atm Atmosphere CAS Chemical Abstracts Service (Registry Number) cm² Square Centimetres CO₂ Carbon Dioxide COD Chemical Oxygen Demand deg C (° C) Degrees Celcius deg F (° F) Degrees Farenheit g Grams g/cm³ Grams per Cubic Centimetre g/l Grams per Litre HSNO Hazardous Substance and New Organism IDLH Immediately Dangerous to Life and Health immiscible Liquids are insoluable in each other. inHg Inch of Mercury inH₂O Inch of Water K Kelvin kg Kilogram kg/m³ Kilograms per Cubic Metre lb Pound LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours. LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals. ltr or L Litre m³ Cubic Metre mbar Millibar mg Milligram mg/24H Milligrams per 24 Hours mg/kg Milligrams per Kilogram mg/m³ Milligrams per Cubic Metre Misc or Miscible Liquids form one homogeneous liquid phase regardless of the amount of either component present. mm Millimetre mmH₂O Millimetres of Water mPa.s Millipascals per Second N/A Not Applicable NIOSH National Institute for Occupational Safety and Health NOHSC National Occupational Heath and Safety Commission OECD Organisation for Economic Co-operation and Development Oz Ounce PEL Permissible Exposure Limit Pa Pascal ppb Parts per Billion ppm Parts per Million ppm/2h Parts per Million per 2 Hours ppm/6h Parts per Million per 6 Hours psi Pounds per Square Inch R Rankine RCP Reciprocal Calculation Procedure STEL Short Term Exposure Limit TLV Threshold Limit Value tne Tonne TWA Time Weighted Average ug/24H Micrograms per 24 Hours UN United Nations wt Weight