

## MATERIAL SAFETY DATA SHEET

### HYDROFLUORIC ACID 40 - 70%

#### 1 Chemical Product & Company Information:

1.1 Product Name **Hydrofluoric Acid 40 - 70%**

Trade Names / Synonyms Hydrofluoric acid solution; Aqueous Hydrofluoric Acid

1.2 Manufacturer SRF Limited, D-2/1 GIDC Phase-II,  
PCPIR, Dahej, Tal. Vagra  
Dist. Bharuch 392 130  
Gujarat (India)

1.3 Emergency Call +91 2641 289 201 / 202

#### 2 Composition & Information on Ingredients:

Chemical Hydrofluoric acid

CAS Number 7664-39-3

UN No 1790

Purity 40-70 % (w/w)

Chemical Water

CAS Number 7732-18-5

Purity 30-60 % (w/w)

#### 3 Hazard Identification:

Symbol Letter Corrosive, Toxic

GHS Pictogram



3.1 Emergency Review:

Appearance Colorless Fuming

Physical State Liquid

Odor Acrid, irritating odor

3.2 Major Health Hazard:

Skin  
May be fatal if absorbed through the skin. Causes severe burns with delayed tissue destruction. Substance is rapidly absorbed through the skin. Penetration may continue for several days. Causes severe tissue necrosis and bone destruction. Both liquid and vapor can cause severe burns, which may not be immediately painful or visible. Solutions as dilute as 2% or lower may cause burns. Systemic fluoride toxicity from exposure to hydrofluoric acid may result in severe hypocalcemia, hypomagnesemia, hyperkalemia,

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metabolic acidosis, cardiac dysrhythmias, and death. Burns caused by weak hydrofluoric acid may go unnoticed for several hours. Therefore, first aid procedures must be followed if any contact is suspected.

## Inhalation

May be fatal if inhaled. May cause severe irritation of the upper respiratory tract with pain, burns and inflammation. May cause pulmonary edema and severe respiratory disturbances. Depletes calcium levels in the body which can lead to hypocalcemia and death. Concentrations of hydrofluoric acid above 40% fume in air.

## Eye

Contact with liquid or vapor causes severe burns and possible irreversible eye damage. Solutions as dilute as 2% or lower may cause burns.

## Ingestion

Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. Human fatalities have been reported from acute poisoning. Systemic fluoride toxicity from exposure to hydrofluoric acid may result in severe hypocalcemia (depletion of calcium in the blood), hypomagnesemia, hyperkalemia, metabolic acidosis, cardiac dysrhythmias, and death.

## Other Hazards

Intake of more than 6 mg of fluorine per day may result in fluorosis, bone and joint damage. Hypocalcemia and hypomagnesemia can occur from absorption of fluoride ion into blood.

## Chronic Effects

Chronic inhalation and ingestion may cause chronic fluoride poisoning (fluorosis) characterized by weight loss, weakness, anemia, brittle bones, and stiff joints. Repeated inhalation may cause chronic bronchitis. Chronic exposure to fluoride compounds may cause systemic toxicity. Skeletal effects may include bone brittleness, joint stiffness, teeth discoloration, tendon calcification, and osteosclerosis. Chronic ingestion or inhalation may cause weight loss, malaise, anemia, leukopenia (reduction in the number of white blood cells in the blood), discoloration of the teeth and osteosclerosis (the hardening or abnormal density of bone). Repeated inhalation may cause osteofluorosis and permanent respiratory damage.

Mutagenic Effects Not available

Teratogenic Effects Not available

Developmental Toxicity Not available.

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## 4 First Aid Measures:

### Eye Contact

Do NOT allow victim to rub eyes or keep eyes closed. Spills of HF should be flushed by Diphotrine or plenty of water for 15-20 minute until medical attention arrives. **SPEEDY ACTION IS CRITICAL! GET MEDICAL ATTENTION IMMEDIATELY!** If a physician is not immediately available, apply one or two drops of 0.5% tetracaine hydrochloride solution followed by a second irrigation until medical attention arrives. Tetracaine hydrochloride will provide ocular anesthesia for 20 min. to an hour

### Skin Contact

Discard contaminated clothing in a manner which limits further exposure. Destroy contaminated shoes. Spills of HF should be flushed by Diphotrine body washer or Plenty of water for 15-20 minutes until medical attention arrives. **SPEEDY ACTION IS CRITICAL! GET MEDICAL ATTENTION IMMEDIATELY.** If available, after thorough washing (PREFERRED METHOD), a 2.5% calcium gluconate Injection / gel should be applied into the burned area, or the burned area should be immersed in a solution of Hymine. It is suggested that a certain quantity of either prepared solution or the calcium gluconate be kept on hand at all times. These should be replaced annually if not previously used. Before using HF, make sure the solutions, gels and first aid attendant are available in case of exposure.

### Inhalation

**SPEED IS ESSENTIAL, OBTAIN MEDICAL AID IMMEDIATELY. POISON material.** If inhaled, get medical aid immediately. Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Calcium gluconate, 2.5% in normal saline may be given by nebulizer with oxygen.

### Ingestion

Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately. **SPEED IS ESSENTIAL. A DOCTOR MUST BE NOTIFIED AT ONCE.**

## 5 Fire Fighting Measures:

Fire & Explosion Hazard As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool.

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Reacts with most metals to form highly flammable hydrogen gas which can form explosive mixtures with air. Containers may explode in the heat of a fire. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.

Extinguishing Media Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Special Fire Fighting Procedures Firefighters should wear self-contained, MSHA/NIOSH-approved breathing apparatus for protection against possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool

Other Hazards Fire may produce poisonous or irritating gases. Violent exothermic reaction occurs with water. Reacts with metals forming flammable Hydrogen gas.

Flash Point Not Available.

Auto ignition Temperature Not Available

Flammability Limits LEL: NA UEL: NA

## 6 Accidental Release Measures:

Spill Absorb spill with inert material (e.g. vermiculite, sand, lime slurry, soda ash, limestone, caustic soda or other alkaline material), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Wear a self-contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Provide ventilation. Evacuate unnecessary personnel. Approach spill from upwind. Remove ignition sources since flammable hydrogen gas may be generated by reactions with metals. Spills may produce white fumes of HF gas. Rapid dilution of the spill with water will reduce the amount of fumes given off. Carefully neutralize the dilute spill with lime slurry, soda ash, limestone, caustic soda or other alkaline material.

Methods for containment Do not let product enter drains. Absorb on vermiculite, sand, lime slurry, soda ash, limestone, caustic soda or other alkaline material, pick up and place in appropriate container. Hold for disposal. Clean contaminated

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floors and objects, thoroughly observing environmental regulations.

## 7 Handling & Storage:

**Handling Precautions** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Discard contaminated shoes. Use caution when opening. Do not breathe vapor or mist. Use only with adequate ventilation or respiratory protection. Do not put even dilute solutions of hydrofluoric acid in glass containers. Always add the acid to water, never the reverse. Never work alone with this chemical.

### Storage

Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area. Do not store in metal or glass containers. Inspect periodically for damage or evidence of leaks or corrosion. Store in approved containers only. Diking of storage containers is recommended.

## 8 Exposure Control, Personal Protection:

### Exposure Limits

CAS# 7664-39-3:

United Kingdom, WEL - TWA: 1.8 ppm TWA (as F); 1.5 mg/m<sup>3</sup> TWA (as F)

United Kingdom, WEL - STEL: 3 ppm STEL (as F); 2.5 mg/m<sup>3</sup> STEL (as F)

United States OSHA: 3 ppm TWA

### Ventilation

Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.

### Eye Protection

Wear chemical splash goggles and face shield.

### Clothing

Wear appropriate protective clothing to prevent skin exposure.

### Gloves

Wear butyl rubber gloves.

### Respirator

Wear a NIOSH/MSHA or European Standard EN 149 approved full-face piece airline respirator in the positive pressure mode with emergency escape provisions.

### Hygiene measures

Take a shower. Remove clothing and clean thoroughly before using again.

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## 9 Physical & Chemical Properties:

Physical state and appearance	colorless - fuming
Taste	Not available.
Molecular Weight	20.01 g/mole
pH (1% solution/ water)	Not applicable
Boiling Point	65 deg C ( 221.00F) at 1013 hPa
Melting Point /Freezing Point	ca -76 ° C
Auto ignition Temperature	Not available.
Specific Gravity	1.175 @ 15.5C
Vapor Pressure	183 hPa @ 21 deg C (70%)
Vapor Density	2.21 at 21.1deg C, 1.76 at 26.7 deg C
Volatility	100
Odor Threshold	Stinging, strong, pungent - irritating odor
Water/ Oil Dist. Coefficient	Not available.
Ionicity (in Water)	Not available.
Dispersion Properties	Not available.
Solubility	Soluble

## 10 Stability & Reactivity:

Stability	Stable at room temperature in closed containers under normal storage and handling conditions. Hydrogen fluoride tends to associate by means of hydrogen bonds to form polymers in both the liquid and gaseous states, but this polymerization is not hazardous.
Instability Temperature	Not Available.
Conditions of Instability	Excess heat, confined spaces. Heat. Containers may rupture or explode if exposed to heat
Incompatibility	Metals, strong oxidizing agents, strong bases, acetic anhydride, alcohols, amines, Glass, concrete and other silicon-bearing materials will yield silicon tetrafluoride gas in contact with HFA. Pressure build up from this process has been known to blow up glass containers., Carbonates, sulfides, and cyanides will yield toxic gases such as carbon dioxide, hydrogen sulfide, and hydrogen cyanide., Carbonates, sulfides, and cyanides will yield toxic gases such as carbon dioxide, hydrogen sulfide, and hydrogen cyanide.
Special Remarks on Reactivity	No hazardous reactions when stored and handled according to prescribed instructions.
Polymerization	Has not been reported.

## 11 Toxicological Information:

Acute oral toxicity: Acute toxicity estimate: 7.14 mg/kg  
Method: Calculation method  
Acute inhalation toxicity : Acute toxicity estimate: 0.76 mg/l , vapour  
Exposure time: 4 h  
Method: Calculation method  
Acute dermal toxicity: Acute toxicity estimate: 7.14 mg/kg  
Method: Calculation method

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## 12 Ecology Information:

Eco toxicity

LC50: 107.5 mg/l  
Exposure time: 96 h  
Species: Oncorhynchus mykiss  
Test substance: Fluoride ion

## 13 Disposal Considerations:

Dispose in accordance with all applicable local regulations.

## 14 Transport Information:

According to national and international transport regulations not classified as dangerous goods  
Non Hazardous for road, sea and air transport.

Proper Shipping Name	HYDROFLUORIC ACID
UN Number	1790
Hazard Class	8 (6.1)
Packing Group	I

## 15 Regulatory Information:

Symbol(s)



### INGREDIENT NAME COMMENT

Refer section 2

### STATE RIGHT-TO-KNOW

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

### INGREDIENT NAME WEIGHT % COMMENT

Refer section 2

## 16 Other Information:

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