



SRF LIMITED

Issue: 02

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SAFETY DATA SHEET

HYDROFLUORIC ACID 20-40% (DHF)

SECTION 1: IDENTIFICATION OF SUBSTANCE OR MIXTURE AND COMPANY

- 1.1 Product Name** : Hydrofluoric Acid 20 – 40 %
- Trade Names / Synonyms** : Hydrofluoric acid solution; Aqueous Hydrofluoric Acid
- HF (50 - 70% w/w)**
- CAS Number** : 7664-39-3
- Water (50 - 30% w/w)**
- CAS Number** : 7732-18-5
- 1.2 Manufacturer/supplier** : SRF Limited, D-2/1 GIDC Phase-II, PCPIR, Dahej, Tal. Vagra, Dist. Bharuch 392 130, Gujarat (India)
- Further information obtainable from:** : Vikas Yadav
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- 1.3 Emergency Call**
- Emergency Contact** : Mr. Balwada +91-9099002602
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- 1.4 Relevant Identified Uses Of The Substance Or Mixture And Uses Advised Against**
- Identified Uses:** : Laboratory chemicals, Manufacture of substances
- Uses advised against:** : Do not use product for anything outside of the above specified uses

SECTION 2: HAZARDS IDENTIFICATION

- 2.1 This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Classification of the substance or mixture	SKIN CORROSION/IRRITATION - Category 1A SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1 Acute toxicity, Oral - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) - Category 1 Acute toxicity, Inhalation - Category 2 Acute toxicity, Dermal (Category 1)
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**GHS leble element
Hazard Pictogram :**



**Single word: Danger
Hazard Statement(s):**

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

Precautinary Statement(s):

P260 Do not breathe dust/ fume/ gas/ mist/ vapors / spray.

P264 Wash face, hands and any exposed skin thoroughly after handling

P273 Avoid release to the environment.

P280 Wear protective gloves/protective clothing/eye protection/face protection

P284 Wear respiratory protection

P391 Collect spillage.

P302 + P350 IF ON SKIN: Gently wash with plenty of soap and water

P305 + P351 + P338 F 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.

SECTION 3: COMPOSITION & INFORMATION ON INGREDIENTS

CAS NO	7664-39-3
EC Number	231-634-8
Molecular Weight	20.01 g/mol

Ingredient	CAS Number	EC Number	Percent	Hazardous	Chemical Characterization
Hydrogen Fluoride	7664-39-3	231-634-8	20 - 40%	Yes	Substance
Water	7732-18-5	231-791-2	60 - 80%	No	Mixture



Product Name- HYDROFLUORIC ACID 20 - 40% (DHF)

Revision Date: 01.10.2020

SECTION 3: FIRST AID MEASURES

3.1 Description of first aid measures

General advice	:	<p>In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.</p> <p>In the case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt seek medical advice</p>
Inhalation	:	<p>Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.</p>
Skin contact	:	<p>Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse</p>
Eye contact	:	<p>Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and</p>



Product Name- HYDROFLUORIC ACID 20 - 40% (DHF)

Revision Date: 01.10.2020

Ingestion : remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician **DO NOT INDUCE VOMITING!** Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

4.2 Most Important Symptoms and Effects, Both Acute and Delayed:

Potential acute health effects

Eye contact : Causes serious eye irritation
 Ingestion : Sever damage
 Inhalation : Toxic if inhaled
 Skin contact : Causes severe burns.

Over-exposure signs/symptoms

Eye contact	Adverse symptoms may include the following:, pain or irritation, watering, redness
Inhalation	No specific data
Skin contact	Adverse symptoms may include the following:, pain or irritation, redness, blistering may occur
Ingestion	Adverse symptoms may include the following, stomach pains.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician	: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	: No specific treatment.
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

SECTION 5. FIRE FIGHTING MEASURE

General Fire Hazards : Not considered to be a fire hazard. Fire may produce poisonous or irritating gases.

5.1 **Extinguishing media Suitable extinguishing media:** : Use an extinguishing agent suitable for the surrounding fire. Hazmet foam can be more suitable for extinguished the fire.

5.2 **Special hazards arising from the substance or mixture** : Non-combustible liquid. Vapors heavier than air. Ambient fire may liberate hazardous vapors.



Product Name- HYDROFLUORIC ACID 20 - 40% (DHF)

Revision Date: 01.10.2020

Hazardous Combustion Products:	:	Decomposition products may include the following materials:halogenated compounds
Advice for firefighters Special fire fighting procedures:	:	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. Contact supplier immediately for specialist advice. 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 firefighters:	:	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

6.1	Personal precautions, protective equipment and emergency procedures	:	Notify safety personnel, provide adequate ventilation, and remove ignition sources since Hydrogen may be generated by reactions with metals. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Evacuate the danger area. Keep unnecessary and unprotected personnel from entering.
6.2	Environmental Precautions	:	Apply magnesium sulfate (dry) to the spill area. Follow up with inert absorbent and add soda ash or magnesium oxide and slaked lime. Collect in appropriate plastic containers and save for disposal. Wash spill site with soda ash solution. NOTE: Porous materials (concrete, wood, plastic, etc.) will absorb HF and become a hazard for an indefinite time. Such spills should be cleaned and neutralized immediately. Do not flush to sewers or waterways! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.
6.3	Methods and material for containment and cleaning up	:	Small spill: Immediately contact emergency personnel. Stop leak if without risk. Immediately contact emergency personnel. Large spill: Stop leak if without risk. Note: see Section1 for emergency contact information and Section 13 for waste disposal.
6.4	Reference to other sections	:	Refer to sections 8 and 13.



SECTION 7: HANDLING & STORAGE

- 7.1 **Precautions for safe handling:** : Keep in tightly closed polyethylene containers. Store in a cool, dry place with adequate ventilation separated from other chemicals. Protect from physical damage. Storage facilities should be constructed for containment and neutralization of spills. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product
- 7.2 **Conditions for safe storage, including any incompatibilities:** : Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not puncture or incinerate container. Empty containers retain product residue and can be hazardous. Do not breathe gas.
- 7.3 **Storage temperature** : Protect from sunlight. Store in a cool and well-ventilated place.
- 7.4 **Storage period** : No data available

SECTION 8 : EXPOSURE CONTROL / PERSONAL PROTECTION CONTROL PARAMETERS

8.1 **Control parameters, e.g., occupational exposure limit values or biological limit values**

Occupational Exposure Limits:

Ingredient name Exposure limits	Ingredient name Exposure limits
Hydrogen Fluoride	ACGIH TLV (United States, 3/2017). Absorbed through skin. Notes: as F C: 2 ppm, (as F) TWA: 0.5 ppm, (as F) 8 hours. NIOSH REL (United States, 10/2016). Notes: as F CEIL: 5 mg/m ³ , (as F) 15 minutes. CEIL: 6 ppm, (as F) 15 minutes. TWA: 2.5 mg/m ³ , (as F) 10 hours. TWA: 3 ppm, (as F) 10 hours. OSHA PEL (United States, 6/2016). Notes: as F TWA: 2.5 mg/m ³ , (as F) 8 hours. OSHA PEL 1989 (United States, 3/1989). Notes: as F STEL: 6 ppm, (as F) 15 minutes. TWA: 3 ppm, (as F) 8 hours. OSHA PEL Z2 (United States, 2/2013). TWA: 3 ppm 8 hours.

8.2 **Exposure controls**

Engineering controls	:	A system of local and / or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details.
<u>Personal protective equipment</u>		
Respiratory protection	:	If the exposure limit is exceeded, a full face piece respirator with an acid gas cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full face piece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in Oxygen-deficient atmospheres. Since the IDLH is low (30 ppm,) the above cartridge system is not specifically approved for HF (reference - 3M Respirator Selection Guide.)
Hand protection	:	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. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
Eye/Faceprotection	:	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead
Protective Hygiene measures	:	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially

Environmental exposure controls: : contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: PHYSICAL & CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	:	Colorless
Physical state	:	Liquid.
Colour	:	Colourless
Odor	:	Acrid odor - do not breathe fumes
Molecular Weight	:	20.01 g/mole
pH (15 aqueous solution)	:	1.0 (0.1M solution)
Melting point/freezing point	:	< -36 °C (< -33°F)
Initial boiling point and boiling range	:	108C (226F)
Evaporation Rate	:	Not determined
Flash point	:	does not flash
Flammability (solid, gas)	:	Not applicable
Viscosity	:	1.4 PAS 20 °C
Partition coefficient; n-octanol/water	:	No data available
Vapour pressure	:	25 @ 20°C (68°F)
Vapour density	:	2.21 at 21.1deg C
Relative density	:	1.153 g/cc for 49 - 50% Hydrofluoric Acid solution
Specific Gravity	:	1.153 (Water = 1)
Flammability Range	:	Not determined

Auto-ignition temperature	:	Not determined
Decomposition temperature	:	No data available
Water solubility	:	Infinitely soluble
Partition coefficient n-octanol/water(ies)	:	No data available

SECTION 10: STABILITY & REACTIVITY

10.1	Reactivity	:	None known, based on information available
10.2	Chemical stability	:	Stable at room temperature (68F) when stored and used under proper conditions.
10.3	Possibility of hazardous reactions	:	Moisture and incompatibles.
10.4	Conditions to avoid	:	No specific data.
10.5	Incompatible materials	:	Hydrofluoric Acid is incompatible with Arsenic Trioxide, Phosphorus Pentoxide, Ammonia, Calcium Oxide, Sodium Hydroxide, Sulfuric Acid, Vinyl Acetate, Ethylenediamine, Acetic Anhydride, alkalis, organic materials, most common metals, rubber, leather, water, strong bases, carbonates, sulfides, cyanides, oxides of silicon, especially glass, concrete, silica, Fluorine. Will also react with steam or water to produce toxic fumes.
10.6	Hazardous decomposition products	:	On contact with metals, liberates Hydrogen gas. On heating to decomposition, could yield toxic fumes of fluorides. Attacks glass and other silicon containing compounds. Reacts with silica to produce Silicon Tetrafluoride, a hazardous colorless gas.

SECTION 11 : TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Actuate Toxicity

LC50 inhalation rat	1276 ppm Rat - 1 h
LD50 Oral (estimated)	7.14 mg/kg
LD50 Dermal (estimated)	7.14 mg/kg

Sensitization	No information available
Mutagenicity	No information available.
Reproductive toxicity	No information available.

Teratogenicity	No information available.
Specific target organ toxicity (single exposure)	NO data available
Specific target organ toxicity (repeated exposure)	NO data available
Aspiration hazard	NO data available
Carcinogenicity	NO data available

Potential acute health effects

Eye contact	Corrosive to the eyes Symptoms of redness, pain, blurred vision, and permanent eye damage may occur.
Inhalation	Corrosive Severely corrosive to the respiratory tract. May cause sore throat, coughing, labored breathing and lung congestion / inflammation.
Skin contact	Corrosive to the skin! Skin contact causes serious skin burns which may not be immediately apparent or painful. Symptoms may be delayed 8 hours or longer. The fluoride ion readily penetrates the skin causing destruction of deep tissue layers and even bone
Ingestion	:Corrosive May cause sore throat, abdominal pain, diarrhea, vomiting, severe burns of the digestive tract, and kidney dysfunction
Aggravation of Pre-existing Conditions	Persons with pre-existing skin disorders, eye problems, or impaired kidney or respiratory function may be more susceptible to the effects of this substance.
Chronic Exposure	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 stream.

SECTION 12: ECOLOGICAL INFORMATION

This material is expected to be slightly toxic to aquatic life.

Product /ingredient name	Result	Species	Exposure
HF	LC50: 107.5 mg/l	Oncorhynchus mykiss	96 hours

12.2-Persistence and degradability

Persistence and degradability	Possibly hazardous short-term degradation products are not likely. However, long term degradation products may arise.
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12.3-Bioaccumulative potential

Bioaccumulative potential	No further relevant information available
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12.4-Mobility in Soil

Mobility in soil	6.5, soil can bind fluorides tightly. High Calcium content will immobilize fluorides, which can be damaging to plants when present in acid soils.
Ecology - soil	No further relevant information available

12.5- Results of PBT and vPvB assessment

No further relevant information available

12.6-Other adverse effect

The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.




SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods

Product : Discharge, treatment, or disposal may be subject to national, state, or local laws.

Contaminated packaging : Since emptied containers retain product residue, follow label warnings even after container is emptied.

SECTION 14: TRANSPORT INFORMATION

ITEM	DOT	IMDG	IATA
UN number	1790	1790	1790
Proper shipping name	Hydrofluoric acid	Hydrofluoric acid	Hydrofluoric acid
Transport hazard class(es)/ Labelling Number	 8 (6.1)	 8 (6.1)	 8 (6.1)
Packaging Group	II	II	II
Environmental hazards	No Marine pollutant	No Marine pollutant	No

Additional information

Other information : No supplementary information available

Special transport precautions : Warning: Corrosive Substances

15. REGULATORY INFORMATION

Hydrogen Fluoride (7664-39-3) is found on the following regulatory list



Product Name- HYDROFLUORIC ACID 20 - 40% (DHF)

Revision Date: 01.10.2020

15.1 US Federal regulations

SARA 313

Component	CAS-No	Reporting threshold for other users	Reporting threshold for manufacturing and processing
Hydrogen Fluoride	7664-39-3	10000 lbs	10000 lbs

SARA 311/312 Hazard Categories	Acute,chronic Threshold Planning Quantity-100 lbs
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15.2 International regulations

National Inventory	Status
Australia - AICS	This material is listed or exempted Australian Hazchem Code: 2R Poison Schedule: S7
TSCA	This material is listed
Canada - DSL	This material is listed or exempted
Europe - EINEC / ELINCS	This material is listed or exempted
Japan - ENCS	This material is listed or exempted
China	Not determined
Taiwan	This material is listed or exempted
Korea - KECI	This material is listed or exempted
New Zealand - NZIoC	This material is listed or exempted
Philippines	This material is listed or exempted
State or local regulations	U.S. - Massachusetts – Right to Know U.S. - New Jersey - Right to Know U.S. - New York - Right to Know U.S. - Pennsylvania - Right to Know

SECTION 16: OTHER INFORMATION

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. SRF Limited-Chemical business shall not be held liable for any damage resulting from handling or from contact with the above product.