

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Hydrofluoric Acid, solution **CHEMICAL FORMULA:** HFA **PRODUCT CODE:**

COMPANY NAME:

PELICHEM: The Chemical Division of NECSA

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2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAME OF SUBSTANCE:

Aqueous Hydrofluoric Acid.

SYNONYMS:

Hydrofluoric Acid, Solution.
Aqueous Hydrogen Fluoride.

UN No:	Ingredients	CAS-No:	Percentage
1790	Hydrogen Fluoride	7664-39-3	70%
	Water	7732-18-5	30%

Technical Grade HF can be supplied in any HF concentration required (e.g. 70%, 60%, 40%). In each case the balance of H₂O varies accordingly.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Very toxic by inhalation, in contact with skin and if swallowed. Causes severe burns. Inhalation of vapors in high concentration may cause shortness of breath (lung oedema). Ingestion causes burns of the upper digestive and respiratory tracts. Will penetrate skin and attack underlying tissues and bone.

4. FIRST AID MEASURES

GENERAL ADVICE:

Remove from exposure, lie down. Show this safety data sheet to the doctor in attendance.

INHALATION:

Remove from exposure, lie down. Consult a physician. Oxygen or artificial respiration is needed. Observe patient for 24 hours for possible delayed symptoms such as delayed pulmonary edema.

INGESTION:

Do not induce vomiting. Administer fluoride-binding substances such as milk. Seek

immediate medical attention.

SKIN CONTACT:

Wash off immediately with plenty of water for at least 15 minutes. Take all contaminated clothing off immediately. Consult a physician. The use of calcium gluconate paste may be considered.

EYE CONTACT:

Rinse thoroughly with plenty of water for at least 30 minutes keeping eyes wide open. Consult a physician.

PRECAUTIONS FOR FIRST AIDERS:

Wear suitable protective equipment. Avoid direct contact with contaminated victim or clothing.

5. FIRE-FIGHTING MEASURES

SPECIFIC HAZARDS:

Reacts violently to water and can splash acid onto personnel.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS:

In case of fire, wear a self-contained breathing apparatus and full protective flameproof clothing.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

Ensure adequate ventilation. Use personal protective equipment; complete suit protecting against Hydrofluoric Acid. Evacuate personnel to safe areas.

ENVIRONMENTAL PRECAUTIONS:

Prevent product from entering drains, environment, or natural watercourses. Contaminated ground to be excavated and removed to approved landfill site.

METHODS FOR CLEANING UP:

Dam up. Neutralize with soda ash or lime. Absorb with inert absorbent material.

7. HANDLING AND STORAGE

TECHNICAL MEASURES AND PRECAUTIONS:

Use only in area provided with appropriate exhaust ventilation.

INCOMPATIBLE PRODUCTS:

Reacts violently with water. Strong oxidizing agents –concrete, glass, ceramics and metals – when less than 70% dilution.

HANDLING AND OPEN STORAGE CONDITIONS:

Keep container tightly closed in a dry, cool and well- ventilated area.

PACKAGING MATERIAL:

70% HF (Industrial grade) mild steel pressure vessels. (Bulk deliveries in South Africa only).

<60% HF 200 liter or 25 liter polyethylene cans.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

ENGINEERING MEASURES TO REDUCE EXPOSURE:

Ensure adequate ventilation, especially in confined areas.

EYE PROTECTION:

Tightly fitting safety goggles and face-shield.

HAND PROTECTION:

Hydrofluoric acid-resistant and solvent-resistant gloves (gloves made of VITON*).

RESPIRATORY PROTECTION:

Wear a positive-pressure supplied-air respirator with face shield. In case of higher concentration, wear self contained breathing apparatus and protective suit.

HYGIENE MEASURES:

Avoid contact with skin, eyes and clothing. When using - do not eat, drink or smoke. Contaminated work clothing should not be allowed out of the workplace.

SKIN AND BODY PROTECTION:

Complete suit with rubber or plastic boots protecting against Hydrofluoric Acid.

CONTROL PARAMETERS:

OSHA PEL (3ppm). ACGIH TLV (3ppm).

9. PHYSICAL AND CHEMICAL PROPERTIES

FORM:

Liquid.

COLOR:

Colorless

DENSITY:

70% HF 1225 km/m₃ at 20 °C

70% HF 1260 km/m₃ at 0 °C

ODOR:

Pungent.

pH:

Strongly acidic.

VAPOR DENSITY:

2.21 (Air 1).

BOILING POINT:

70% HF / 65°C 1 atm

MELTING POINT:

70% HF / - 75°C

SOLUBILITY:

Water solubility - complete miscible.

MOLECULAR WEIGHT

(HF):

20.01

VAPOR PRESSURE:

70% HF 20kPa at 20°C.

70% HF 43kPa at 40°C.

10. STABILITY AND REACTIVITY

STABILITY:

Stable at normal conditions.

CONDITIONS TO AVOID:

None.

HAZARDOUS DECOMPOSITION PRODUCTS:

Toxic fluoride compounds and hydrogen in certain reactions.

MATERIALS TO AVOID:

Glass, metals, bases and organic materials.

11. TOXICOLOGICAL INFORMATION

HUMAN EXPERIENCE:

Will penetrate skin and attack underlying tissues and bone.

Will penetrate skin and attack underlying tissues, as HF is a calcium "scavenger" binding with calcium in the bloodstream and bones.

CHRONIC TOXICITY:

May cause fluorosis.

LOCAL EFFECTS:

Very toxic by inhalation, in contact with skin and if swallowed. Risk of serious damage to eyes. Ingestion causes burns of the upper digestive and respiratory tracts. Causes severe burns.

ACUTE TOXICITY:

LC50/inhalation/1h/mouse = 342ppm.

12. ECOLOGICAL INFORMATION:

ECOTOXICITY:

Acute fish toxicity = 60ppm*/fish/lethal/fresh water * = time period not specified.

Unlikely to persist as natural alkalinity will slowly dissipate the acidity.

13. DISPOSAL CONSIDERATIONS

SAFE AND PREFERRED DISPOSAL METHODS:

Contact manufacturer.

CONTAMINATED PACKAGING:

Contact manufacturer.

14a. TRANSPORT INFORMATION FOR > 60% HF

UN NO: 1790	EMERGENCY ACTION CODE: 2XE	Proper shipping name: Hydrofluoric Acid, with more than 60% hydrofluoric acid
ADR/RID: Class: 8;6.1 TREM-CARD: 703	ADR/RID-Labels: Corrosive	
IMO: Class: 8;6.1 Packaging group: I MFAG: 750	IMDG Page: 8184 IMO-Labels: Corrosive Subrisk: Toxic EmS: 8.03	
IATA: UN No: 1790 Packaging group: I	CLASS: 8;6.1 ICAO-Labels: Corrosive Subrisk: Toxic	

14b. TRANSPORT INFORMATION FOR < 60% HF

UN NO: 1790	EMERGENCY ACTION CODE: 2XE	Proper shipping name: Hydrofluoric Acid, with not more than 60% hydrofluoric acid
ADR/RID: Class: 8;6.1 TREM-CARD: 704	ITEM: 07a ADR/RID-Labels: Corrosive	
IMO: Class: 8;6.1 Packaging group: II MFAG: 750	IMDG Page: 8175 IMO-Labels: Corrosive Subrisk: Toxic EmS: 8.03	
IATA: UN No: 1790 Packaging group: II	CLASS: 8;6.1 ICAO-Labels: Corrosive Subrisk: Toxic	

15. REGULATORY INFORMATION

APPLICABLE REGULATIONS:

Refer to country of destination.

SAFETY AND RISK PHRASES:

According to (National equivalent of EC-Dir.67/548), as amended, the product is labeled as follows:

- T+** : Very Toxic
- C** : Corrosive
- R26/27/28** : Very toxic by inhalation, in contact with skin and if swallowed.
- R35** : Causes severe burns.
- S7/9** : Keep container tightly closed and in well ventilated area.
- S26** : In case of contact with eyes, rinse immediately with plenty of water and seek medical advise.
- S36/37/39** : Wear suitable protective clothing, gloves and eye/face protection.
- S45** : In case of an accident or if you feel unwell, seek medical advice immediately (show label where possible).

16. OTHER INFORMATION

RECOMMENDED USE:

1. Pickling agent for stainless steel.
2. Polishing of cut glass.
3. Cleaning of diamonds.
4. Chemical cleaning of components.
5. Preparation of natural gas wells.
6. Preparation of metal surfaces for plating.

REFERENCES:

1. (CED) Chemical Exchange Directory S.A., Geneva, Switzerland.
2. Hydrogen Fluoride Handling Guidelines, AECI Chloralkali and Plastics LTD, Sasolburg, South Africa, April 1989.
3. Unpublished Reports, AEC of SA Ltd, Pelindaba, South Africa, 1993.
4. IMDG, SABS 0228, SABS 0229.

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