1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

Product identifier:

Product name: Hydrofluoric Acid 7-60%

Synonyms: Hydro-hydrofluoric Acid < 60% Hydrogen Fluoride < 60%

CAS-No.: 7664-39-3

EC (EINECS) No.: 231-634-8

REACH registration number: 01-2119458860-33-XXXX

Relevant identified uses of the substance or mixture and uses advised against:

Identified use(s): Pickling of copper, brass and stainless steel. Dissolution of metals. Control of beer fermentation. Yeast manufacture. Production of fluorides and other fluorine compounds. Flotation of minerals. Cleaning outsides of stones or building bricks. Electro polishing of metals. Polishing, etching and frosting of glass. Purification of graphite. Purification of filter paper. Treatment prior to electroplating.

Uses advised against: No further relevant information.

Company name:
Nexchem Ltd
Unit 3 Barshaw Park
Leycroft Road
Leicester
LE4 1ET
Tel: 0116 2311130
24/7 Emergency Tel: 0800 246 1274
Email: sales@nexchem.co.uk

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture:

Regulation 1272/2008 (CLP):
Acute oral toxicity category 2
Acute cutaneous toxicity category 1
Acute inhalation toxicity category 2
Cutaneous corrosion category 1A

Label elements:

According to Regulation (EC) No. 1272/2008:

Hazard Pictogram:

Signal word: Danger

[cont...]

Hazard statements:

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

Precautionary statements:

P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P264: Wash thoroughly after handling.
P301+310: IF SWALLOWED: Immediately call a POISON CENTRE or doctor/physician.
P405: Store locked up P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P361: Remove/take off immediately all contaminated clothing.
P501: Dispose of contents/containers via specialist disposal companies.

Physicochemical hazards:

Very volatile liquid. Its vapours, on contact with moisture, moist air, produce abundant and dense white fumes. Hydrogen Fluoride, in absence of moisture and at ambient temperature, does not attack steel, cop per, nickel aluminium or lead. On the contrary, its aqueous solutions attack most metals give off flammable gaseous hydrogen.
Reacts intensely (exothermic) with water and lye. Reacts violently with oxidant substances, giving off Fluor.

Environmental hazards:

Toxic effect in fish and plankton, as well as in fixed organisms, due to a variation in pH. It is a strong air pollutant.

Hazards to human health:

Very toxic on inhalation, ingestion and skin contact. It causes serious burns. The absorption of fluoride ions in the blood by inhalation of dust or fumes, by ingestion or skin absorption can reduce serum calcium levels causing possible hypocalcaemia, as well as magnesium causing possible hypomagnesia, besides causing inhibition of vital enzymes. It can also cause dangerous and notable metabolic disorders and kidney and liver functions. In cases of prolonged and repeated exposures, the absorption of fluoride ions in the blood can cause fluorosis (fixation of calcium in the bones by fluorides). The symptoms of overexposure to fluorides may include salivation, nauseas, vomiting, abdominal pain, diarrhoeas, fever, hard breathing. The symptoms of severe poisoning include hard breathing, pulmonary congestion, muscular spasms, convulsions, collapse.

Other hazards:

It is not considered a PBT or vPvB substance.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substance:

Chemical family: Inorganic Fluoride.
Chemical name: Hydrogen Fluoride, HF 60%
EC No.: 231-634-8
CAS No.: 7664-39-3

[cont...]

4. FIRST AID MEASURES (SYMPTOMS)

Description of first aid measures:

Inhalation: Causes burns in the respiratory tract. It can also cause inflammation of the lungs, congestion, pulmonary oedema, fever and cyanosis, which may not appear until 12-24h after exposure. It can be fatal. Prolonged or repeated exposure to low concentrations of gas can cause nasal congestion, nosebleed and bronchitis. It is almost impossible for anyone consciously to inhale enough HF to do serious damage, as it is too irritating to inhale it voluntarily.
Remove the affected person from the danger area, make him as comfortable as possible and protect him from the cold. Administer calcium tablets as for skin contact. If his breathing is laboured, give him oxygen through a facemask. Medical treatment should be sought as soon as possible.

Skin contact: Direct contact of the liquid with the skin cause immediate burns, which become more intense with time, though they may vary according to the contact time and the speed of treatment, developing from erythema and vesicles to true burns with necrosis and ulceration.
Dilute solutions may also cause burns, which are scarcely noticeable at first.
Fluoride ions penetrate skin and tissue quickly, causing necrosis in soft tissue and decalcification in bones.
Unlike other acids, which are soon neutralised, this process can go on for days. Several fatalities have been reported due to large-scale splashing. Death usually occurs suddenly 2-10 hours after exposure due to respiratory problems and heart failure.
It can be absorbed through the skin in toxic amounts.
Immediately remove soiled or splashed clothing. Wash with plenty of water for at least 5 minutes, then rub with calcium gluconate at 2.5 % solution into the affected area until 15 minutes after local pain ceases. If necessary, apply a dressing or bandage soaked in 10% calcium gluconate solution. In case there is not calcium gluconate available, washing with water should be prolonged for 15 minutes.
For skin burn s bigger than a human hand (approx. 150 cm^2), administer also 6 effervescent calcium tablets dissolved in water (400 mg of calcium each) every 2 hours until the patient is admitted to hospital.
For very widespread burns, give the patient a full bath in a solution of 1-5% calcium gluconate.
Medical treatment should be sought as soon as possible.

Eye contact: The substance is lachrymal and causes painful burns, which can result in permanent eye damage or blindness. Wash the eyes immediately with abundant water for 10-15 minutes keeping the lids open. Then wash with normal isotonic saline solution for 5 minutes. See an ophthalmologist immediately.

Ingestion: It causes necrosis of the mouth, oesophagus and stomach. It can cause nausea, vomiting, diarrhoea and circulatory collapse. Orally administer 6 effervescent calcium tablets dissolved in water. If no such tablets are available, make the patient drink milk. Do not induce vomiting.
Medical treatment should be sought as soon as possible.

Most import symptoms and effects, both acute and delayed: The immediacy of treatment is essential to reduce the severity of the consequences of burns or poison.

[cont...]

Indication of any immediate medical attention and special treatment needed: It is strongly recommended the presence of emergency showers and eye baths close to workstations.
Because of the singularity of fluorides burns and poisoning, accident assistance and emergency services at local hospitals should be duly informed of the specific and concrete medical treatment required.
For specialist advice physicians should contact the Poisons Information Service.

5. FIRE-FIGHTING MEASURES

Extinguishing Media: The product is non-combustible. Use fire-extinguishing media appropriate for surrounding materials.

Special hazards arising from the substance or mixture: There is a danger of containers' bursting when affected by heat from fires close by. Remove containers to a safe area provided this operation can be performed safely. Spray water over the containers exposed to fire to cool them. When the containers are opened, ensure that there are not sparks or fire-starting devices in the vicinity. Release of very toxic and corrosive HF.

Advice for fire-fighters: Breathing apparatuses and full chemical protective clothing should be worn when extinguishing fires.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Provide good ventilation. Those fighting the spill should wear suitable protective clothing (see section 8). Restrict access to area until completely clean to people who do not use personal protective equipment. Prevent the entry of product in basements.

Environmental precautions: Prevent soil, water and drain pollution. Extracted air, which may be contaminated with large amounts of fumes, should be treated with a washing system using the moist way before being released into the atmosphere.

Methods and material for containment and cleaning up: If possible, upturn leaky container so that gas, rather than liquid, leaks out. Contain leaks with sand, earth or an absorbent material. Dilute with abundant water. Spray water to damp down gases/fumes that may be leaking out. Neutralize with lime. Do not tip waste down drains.

Reference to other sections: See sections 8 and 13.

7. HANDLING AND STORAGE

Precautions for safe handling: Provide good ventilation. Handle containers with care to prevent breaking or damaging the valves. Handle and open the container with care due to a possible overpressure. Empty, transfer, dilute, dissolve product, etc. according to strict guidelines to avoid local heating, splashes of liquid and emission of fumes. Prevent accumulation of partly spent containers. Partially used containers should be hermetically resealed after use and returned to the store. Empty containers contain residues, so they should be handled as if they were full.

[cont...]

Conditions for safe storage, including any incompatibilities: Keep containers hermetically sealed in a cool, well- ventilated place, protected against physical damage, heat and direct sunlight and separate from easily flammable materials. The containers should be inspected regularly for early detection of damage or leakage Stores should be well away from busy working areas. They should have two exit doors as far apart as possible and personal protection equipment should be kept outside these doors.
In Spain, storage must meet the R. D. 379/200 1 (Chemical products storage regulations) if the quantity stored is above 50 l.
Suitable packaging's are pressurised steel containers, steel containers under atmospheric pressure with gas cleaning system, tanks and ISO-containers.

Specific end use(s): See section 1.2.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters: Limit level for repeated exposures: VLA – ED: 1.5 mg (F) / m3 – INSHT Guide.
Limit level for short time exposures: VLA - ED: 1.5 mg (F) / m3 - INSHT Guide.
Biological limit level – VLB
Biological indicator: Fluorides in urine.
End of working day: 8 mg /l. – INSHT Guide
Before shift: 4 mg /g creatinine, after shift 7 mg /g creatinine – BAT.

DNEL: Derived no effect level:

Exposure pattern	Route	Value	Effects	Population
Acute effects (systemic and local)	Inhalation	2.5mg/m3	Irritation (respiratory tract)	Workers
Long-term effects (systemic and local)	Inhalation	1.5mg/m3	Irritation (respiratory tract)	Workers

PNEC: Predicted No Effect Concentration:

	Value
Fresh water	0.9 mg/l
Salt water	0.9 mg/l
Sediments	0.766 mg/kg w/w

Exposure controls: Local exhausting is recommended to maintain fume emissions below the exposure lowest admissible level. It is also advisable the presence of anti-splash screens at points where product is used.

Appropriate engineering controls: It is compulsory to wear personal protective equipment when handling this product. Do not eat, drink or smoke while working. Before breaks, wash hands. After work shower or wash. Change working clothes after handling the product. Remove soiled or splashed clothing and wash it before re-using it. Shower and washroom facilities should be separate from changing rooms. The substance must be kept away from food, drink and condiments.

Respiratory protection: If engineering checks, working, practices or administrative checks are not effective in reducing concentrations to below legal limits for exposure, use breathing apparatus. Depending on the level of fumes, the appropriate breathing equipment –all of them EPI's class 3-, can be a face mask with replaceable filters type E1 - E2, a hood with eye-window of suitable plastic and replaceable filters of the same type as the previous ones, or autonomous insulation equipment or with airline.

[cont...]

Hand protection: Chemical protective gloves of a suitable material (e.g. Viton, Neoprene, PVC).

Eye protection: Well-fitted chemical protective goggles type motorist or diver, with plastic lenses (e.g. clear PVC), or a facial safety screen. It is generally known that contact lenses must not be wear when working with chemicals because they may contribute to the severeness of possible damages in the eyes.

Skin protection: In normal conditions, an apron of suitable material (e.g. Viton, Neoprene), normal protective overall with long sleeves, and chemical protective boots (Viton, Neoprene, etc.). Additionally, for works with possible contact with the product, wear EPI's class 3, type 3 (liquid tightness) of suitable material (Composite, Viton, PCV), and for emergencies an EPI class 3 type 1 (gas-proof) of the same materials, with autonomous breathing equipment.

Environmental exposure controls: Specific gaseous emissions levels according to integrated environmental authorisation R. D. 833 / 1975 – Gaseous Emission (out of the manufacturing site).
Fluorides 60 µg / m3 (30').
Fluorides 20 µg / m3 (1 day).

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Liquid.

Colour: Clear-yellow

Odour: Acrid

Odorous threshold: 0.04 to 0.13 ppm (AHF)

Melting point / freezing point: -42ºC

Flammability: Non-flammable

Initial boiling point and boiling range: Approx. 85 ºC at 1013 mbar

Explosivity: Non-explosive

Vapour pressure: Approx. 55 mbar at 20ºC

Vapour density: Variable according to polymerization grade, subject to temperature variation.

Relative Density: Approx. 1.21 g/cm^3 at 25ºC

Solubility in water: Miscible in all proportions

Solubility in other chemicals: Very soluble in ethanol and other organic solvents

Partition co-efficient n-octanol/water: No data available

Auto ignition temperature: Non-flammable

Decomposition temperature: No data available

Dynamic viscosity: No data available

Explosive properties: Non-explosive

Comburent properties: Non-comburent

Other information:

Miscibility: Miscible in water

Liposolubility: No data available

Conductivity: No data available

[cont...]

10. STABILITY AND REACTIVITY

Reactivity: Contact with steel, at a high temperature and/or moisture, and with many other metals, results in the emission of flammable gaseous Hydrogen.

Chemical stability: It is stable under normal conditions.

Possibility of hazardous reactions: No further relevant information.

Conditions to avoid: Heating.

Incompatible materials: It attacks silica, silicates and specially glass. It should not be kept in glass, cement, metals containing silica, ceramics, natural rubber, leather and many other organic polymers. It reacts intensely with water, lye, oxidant salts (cyanides, hypochlorites), and amines.

Hazardous decomposition products: No further relevant information.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects: Very toxic substance by ingestion, inhalation and in contact with the skin.
The EU RAR suggests that the liquid or gaseous hydrogen fluoride in contact with skin may cause serious injury, including systemic effects (cardiac). Research with diluted hydrofluoric acid in contact with the skin of rabbits has shown local corrosive effects but no systemic toxicity. No data available for acute toxicity.

Skin corrosion/irritation: Highly toxic and corrosive substance that causes rapid destruction of tissue in contact with the skin. Corrosive effects occur with 5% HF. Contac t with HF 20% is enough to cause damage to the skin of rats and even hypocalcaemia in case of prolonged contact. Small burns with HF 4 0% cause profound tissue necrosis in a short time, causing hypocalcaemia in 24 hours.

Serious eye damage/irritation: Strongly caustic action.
Human eyes - 50 mg - severe irritation.

Respiratory or skin sensitisation: The experience of fluoride ion sensitisation is unlikely.

Germ cell mutagenicity: No symptoms leading to suspicion of mutagenic effect (Ames test). (Research conducted at the Institute of Toxicology, BAYER AG).

Carcinogenicity: There is no evidence of an association between cancer and exposure to inorganic fluorides (IARC).

Reproductive toxicity: There is no evidence that fluoride ion is toxic to reproduction.

Specific toxicity in certain organs (STOT) – single exposure: In view of the available data, the criteria for classification are not met.

Specific toxicity in certain organs (STOT) – repeated exposure: In view of the available data, the criteria for classification are not met.

Aspiration hazard: Very toxic and corrosive substance that causes rapid destruction of tissue by inhalation.
LC50 – rat: 4970, 2690, 2040 and 1310 ppm with exposures of 5, 15, 30 and 60 minutes respectively. It causes eye irritation and nasal and respiratory problems. With 18200 ppm in 5 minutes causes death within 24 hours from pulmonary oedema.
LC50 – Guinea pig: 4327 ppm / 5 minutes.

[cont...]

12. ECOLOGICAL INFORMATION

Toxicity: Toxic effect in fish and plankton, plants and foliage. Persistent in the soil. Soil will strongly bind fluoride if the pH is >6.5. High calcium content will also immobilise fluorides. Prevent contamination of surface water, wastewater and ground.

Persistence and degradability: No experimental data available.

Bio accumulative potential: The product has bioaccumulative potential in aquatic organisms.

Mobility in soil: The product has low mobility in soil. The soil natural alkalinity will slowly drive away the acidity. Soil will strongly bind fluoride if the pH is >6.5. High calcium content will also immobilise fluorides.

Results of PBT and vPvB assessment: It is not considered a PBT or vPvB substance.

Other adverse effects: Large leakages of HF to the aquatic environment could lead to over acidification with resultant damage to aquatic life. Soluble fluoride may be toxic to aquatic organisms. LC50 Fish – 60 ppm.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods: Use as much quantity of product as possible in the production cycle. Residual solutions of hydrofluoric acid should be adequately treated before being evacuated. Residual solutions should be neutralized with an alkali being recommended lime better than sodium hydroxide. Add this alkali carefully, or in diluted solution form, to prevent excessive heat generation.

14. TRANSPORT INFORMATION

Proper shipping name: Hydrofluoric acid with not more than 60% hydrogen fluoride

Transport hazard class ADR Class: 8

Class 8: Corrosive substances

Class 6.1: Toxic substances

Packing group: II

ADR Hazard Number: 86 Corrosive or slightly corrosive substance, toxic

ADR Hazard Number: 86

ADR Label Number: 8 + 6.1

Tunnel Code: E

[cont...]

Environmental: It is not considered hazardous to the environment.

Special precautions for users: Keep away from foodstuffs and pharmaceuticals.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: No further relevant information.

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture: As this material is very toxic, it is included in SEVESO category.

Chemical safety assessment: A Chemical Safety Assessment has been carried out

Note: The regulatory information given above only indicates the principal regulations specifically Applicable to the product described in the safety data sheet. The user's attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all applicable national, international and local regulations or provisions.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3:

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

Source of key data used to compile the data sheet: Supplier information

Legal disclaimer: The information contained in this SDS does not constitute a risk assessment, and should not replace the user's own assessment of risks as required by other health and safety legislation. This advice is given by Nexchem Ltd who accept no legal liability for it except otherwise provided by law. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be construed as guaranteeing specific properties.