EUROFLUOR
A snapshot of the Fluorine Industry

EU **SAFETY DATA SHEET**
according to Regulation (EC) No. 1907/2006 and Regulation (EC) No. 453/2010

Hydrogen fluoride anhydrous

Material number F001

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Section 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name:	Hydrogen fluoride anhydrous
CAS number:	7664-39-3
EINECS number	231-634-8
REACH registration No.:	01-211xxxxxxxxx-xxxx

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

Chemical basic material

1.3 Details of the supplier of the safety data sheet

Company name:	**CEFIC / CTEF Sample**
Street/POB-No.:	
State/city /postal code:	
World Wide Web:	www.Eurofluor.org
Email:	info@Eurofluor.org
Telephone:	
Telefax:	
Dept. responsible for information:	

1.4 Emergency telephone number

See your national chemical association for this information.

See also documents written by CTEF European security Organisations (http://www.eurofluor.org/publications.html).

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Section 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to EC regulation 1272/2008 (CLP):

Skin Corr. 1A;	H314	Causes severe skin burns and eye damage.
Acute Toxicity 2;	H330	Fatal if inhaled.
Acute Toxicity 1;	H310	Fatal in contact with skin.
Acute Toxicity 2;	H300	Fatal if swallowed.

Classification according to directive 67/548/EEC:

T+;	R26/27/28	Very toxic by inhalation, in contact with skin and if swallowed.
C;	R35	Causes severe burns.

2.2 Label elements

Labelling (CLP)

Signal word **Danger**

Hazard Statements

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

Safety precautions

P260	Do not breathe fume/gas/mist/vapours/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338	IF 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.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P501	Dispose of contents/container to hazardous or special waste collection point.

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Labelling (67/548/EEC or 1999/45/EC)

T+
Very toxic

C
corrosive

R phrase(s):	R 26/27/28	Very toxic by inhalation, in contact with skin and if swallowed.
	R 35	Causes severe burns.
S phrase(s):	S 7/9	Keep container tightly closed and in a well-ventilated place.
	S 26	In case of contact with eyes rinse immediately with plenty of water and seek medical advice.
	S 36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
	S 45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

2.3 Other hazards

Container under pressure. Heating causes rise in pressure with risk of bursting.

Section 3: Composition/ Information on ingredients

3.1 Substances

Chemical characterization (substance)
F H = HF, hydrogen fluoride

CAS-Number:	7664-39-3
EINECS-Number:	231-634-8
RTECS-Number:	MW7875000
EU-number:	009-002-00-6

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Section 4: First-aid measures

4.1 Description of first aid measures

General information:

First aider:	Pay attention to self-protection! Wear suitable protective clothing. Consult immediately first-aid doctor. Symptoms may occur with delay. Take off immediately all contaminated clothing. Put victim at rest and keep warm.
After inhalation:	Provide fresh air. Seek medical attention immediately. Keep airway open. In case of irregular breathing or respiratory arrest provide artificial respiration. No mouth-to-mouth or mouth-to-nose artificial respiration. If victim is at risk of losing consciousness, position and transport him/her on their side.
In case of skin contact:	Rinse with plenty of water for maximum 5 minutes. Call a physician in any case! Apply calcium gluconate gel (2,5%) and massage into the skin until the pain subsides. Continue gel therapy for at least another 15 minutes after pain has subsided. (Preparation Ca-gluconatgel: boil 5 g of calcium gluconate in 85 ml of hot distilled water, add 10 g glycerol and allow 5 g of Tylose C600 to swell in the hot solution. Keep in a cool place). If no Ca-gluconate gel is available, apply several dressings thoroughly moistened with calcium gluconate solution 10%.
After eye contact:	Decontamination: Go to the nearest eye wash or clean source of water, open the water valve, put your eye(s) in the water flow and open and close your eye lids for 5 minutes maximum. Irrigate each eye with 1 litre of a 1% calcium gluconate solution for a minimum period of 15 minutes or if necessary until medical aid is available. Obtain medical attention immediately, especially specialised ophthalmic attention.
After swallowing:	Immediately get medical attention. Do not induce vomiting. Caution: Risk of perforation in case of vomiting! If the victim is able to swallow, give him oral calcium solutions or calcium based antacids, milk or water. If the victim is unconscious obtain medical attention immediately. As a laxative, affected person should drink sodium sulfate (1 tablespoon in 1/4 l water).

4.2 Most important symptoms and effects, both acute and delayed

Systemic effects:	Collapse, spasms, cardiovascular disorders, liver and kidney damage.
After inhalation:	Burns, damage of respiratory tract. > 3 ppm: irritation to respiratory tract.
In case of ingestion:	Pain, nausea, vomiting with blood, spasms.
After contact with skin:	Causes poorly healing wounds, necrosis, pain, shortage of breath, death.

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4.3 Indication of any immediate medical attention and special treatment needed

If a systemic action is suspected, monitoring and treatment in an intensive care unit is urgently required.

Caution: Ventricular fibrillation due to electrolyte imbalance.

Attention: several hours latency period. Counter measurements must be implemented at once. Treatment with Ca-Gluconate solution.

Section 5: Fire fighting measures

5.1 Extinguishing media

Suitable extinguishing media:

Product is non-combustible. Extinguishing materials should therefore be selected according to surroundings.

5.2 Special hazards arising from the substance or mixture

Fires in the immediate vicinity may cause the development of dangerous vapours.

Release of: hydrogen fluoride. Seal off endangered area.

5.3 Advice for fire fighters

Special protective equipment for fire fighters:

Wear a self-contained breathing apparatus and chemical protective clothing.

Additional information:

Exposure to fire may cause containers to rupture/explode.
Cool endangered containers with water spray and, if possible, remove from danger zone. Do not allow water used to extinguish fire to enter drains, ground or waterways. Treat runoff as hazardous.

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Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Keep away from unprotected people. Remove persons not involved upwind. Wear a self-contained breathing apparatus and chemical protective clothing. Avoid contact with the substance. Do not breathe vapours.
Plug leak if safely possible.

6.2 Environmental precautions

Do not allow to penetrate into soil, water bodies or drains.
In case of release, notify competent authorities.

6.3 Methods and material for containment and cleaning up

Render harmless: Treat with a mixture of lime in sodium carbonate solution (precipitation as calcium fluoride). Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents) and place in closed containers for disposal.
In case of spills of large quantities: Contact expert.

Additional information: Suppress gases/vapours/mists with water spray jet.

6.4 Reference to other sections

Not required

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Section 7: Handling and storage

7.1 Precautions for safe handling

Advices on safe handling:

Make sure there is sufficient air exchange and / or that working rooms are air suctioned.
Avoid aerosol and mist formation. Extract vapours by suction at point of emission.
Do not inhale substance. Use appropriate respiratory protection.
Avoid contact with liquid and vapour. Do not allow containers to stand open. Use caution when opening containers under pressure.
The material is to be handled with extreme caution.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storerooms and containers:

Keep container tightly closed in a cool, well-ventilated place.
Protect containers against air humidity and water.
Provide for retaining containers, eg. floor pan without outflow.
Attention: Empty containers will retain product residue and are to handle as though they are full.
Qualified materials: steel, Refined steel, Nickel, Teflon, polyethylene, PVC, fluoro rubber.
Unsuitable materials: Aluminium, copper, brass, glass, ceramic.

Hints on joint storage:

Avoid contact with alkali metals, alkaline earth metals, light metals, silicon compounds, alkalis and ammonia.

Further details: Only trained personnel may be allowed to enter storage area.
Follow local regulation for storage of HF.

7.3 Specific end uses

Chemical basic material

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Section 8: Exposure controls / Personal protection

8.1 Control parameters

Follow local regulation such as for Europe:

Type	Limit value
Europe, IOELV: TWA	(hydrogen fluoride) 1.5 mg/m³; 1.8 ppm
Europe, IOELV: STEL	(hydrogen fluoride) 2.5 mg/m³; 3 ppm

8.2 Exposure controls

Transfer and handle product only in closed systems.
In case of spill or release: Withdraw by suction.

Occupational exposure controls

Respiratory protection:

Respiratory protection must be worn whenever the WEL levels have been exceeded.
Use filter type E according to EN 141. Possible alternatives: filter B.
Carry along escape equipment (self rescuer). Have a breathing apparatus that is not dependent on the circulating air ready for emergencies.

Hand protection:

Liquid: only use protective gloves according to EN 374 which are suitable for HF.
e.g. glove material: Fluororubber (Viton) (0.4 mm) / Neoprene.
Breakthrough time >= 480 min.
Unsuitable materials: natural rubber, Nitrile rubber.
Observe glove manufacturer's instructions concerning penetrability and breakthrough time.
Protective gloves have to be replaced at the first sign of deterioration.

Eye protection: Tightly sealed safety glasses according to EN 166.
In case of increased risk, additionally Wear face protective shield.

Body protection: HF-proof protective clothing, boots.
Wear full protective gear according to the Risk Assessment.

General protection and hygiene measures:

When using do not eat or drink.
Take off immediately all contaminated clothing.
Wash hands before breaks and after work.
Safety shower and eye wash station should be easily accessible to the work area.

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Section 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state:	at room temperature: gas, liquefied at below 19.5 °C: fuming liquid
Colour	colourless
Odour:	pungent
Boiling temperature / boiling range	19.5 °C
Melting point / melting range	-83.4 °C
Flash point / flash point range:	not combustible
Vapour pressure:	at 20 °C: 1053 hPa at 30 °C: 1466 hPa at 40 °C: 2053 hPa at 50 °C: 2733 hPa
Density :	at 20 °C: 0.97 g/mL at 30 °C: 0.95 g/mL at 40 °C: 0.93 g/mL at 50 °C: 0.91 g/mL
pH value:	at 20 °C: <= 1
Water solubility:	fully miscible
Partition coefficient n-octanol /water:	-1.4 log P(o/w) Bio-accumulation is not to be expected (log P(o/w) <1).
Viscosity, dynamic:	at 0 °C: 0.26 mPa*s

9.2 Other information

Molecular weight:	20.01 g/mol
Odour threshold:	0.03 - 0.13 mg/m³
Relative vapour density at 20 °C (air=1):	0.71
Critical temperature:	188 °C
Critical pressure:	64.85 bar
Critical density:	0.29 kg/L

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Section 10: Stability and reactivity

10.1 Reactivity

Violent reaction with alkali metals, alkaline earth metals, light metals. Formation of Hydrogen. Danger of explosion!

10.2 Chemical stability

Hygroscopic.
Corrodes metal in the presence of water or moisture. Formation of hydrofluoric acid.

10.3 Possibility of hazardous reactions

Reacts with sulphuric acid, nitric acid, ammonia and alkalis.

10.4 Conditions to avoid

Protect from humidity and water.

10.5 Incompatible materials

Methanesulphonic acid, Diarsenic trioxide, phosphorus pentaoxide, silicon compounds, glass, ceramic

10.6 Hazardous decomposition products

hydrogen

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Section 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity:	LC50 Rat, inhalative: 1276 ppm/1h LC50 Mouse, inhalative: 342 ppm/1h LCLo human, inhalative: 50 ppm/30min
After inhalation:	Highly toxic. Causes severe burns. Inhalation may have lethal effect. Risk of resorption. Danger of lung oedema.
After swallowing: Liquid:	Causes severe burns. Risk of perforation in the oesophagus and stomach. May be fatal if swallowed.
In case of skin contact:	Causes severe burns. In case of extensive skin contact serious poisoning possible.
After eye contact:	Causes severe burns. Risk of serious damage to eyes. Danger of loss of sight!

Symptoms

Systemic effects:	Collapse, spasms, cardiovascular disorders, liver and kidney damage.
After inhalation:	Burns, damage of respiratory tract. > 3 ppm: irritation to respiratory tract.
In case of ingestion:	Pain, nausea, vomiting with blood, spasms.
After contact with skin:	Causes poorly healing wounds, necrosis, pain, shortage of breath, death.

General remarks

Attention:	several hours latency period. Counter measurements must be implemented at once.

sample

Section 12: Ecological information

12.1 Toxicity

Aquatic toxicity: Toxic effect on fishes and plankton. Harmful effects by modification of pH-value.
Forms corrosive mixtures with water even if diluted.

12.2. Persistence and degradability

Further details: No data available

Effects in sewage plants: Do not release undiluted and unneutralized to the sewer.

12.3 Bio accumulative potential

Bio concentration factor (BCF)

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Not applicable

12.6 Other adverse effects

General information: Do not allow to enter into ground-water, surface water or drains. Danger to drinking water.

Sample

Section 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste key number 060103*: hydrofluoric acid.
Dispose of waste according to applicable legislation.
Neutralize larger quantities with lime or other alkalis. Dispose of in accordance with local, state, and federal regulations. Contact expert.

Contaminated packaging

Recommendation:	Carriage on tank wagon/Carriage on tank-lorry.
Attention:	Containers will enclose product residues and vapours after being emptied. Emptying/filling by specialized personnel only.

Follow local waste disposal regulation.

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Section 14: Transport information

14.1 UN number

ADR, IMDG, IATA: 1052

14.2 UN proper shipping name

ADR: UN 1052, HYDROGEN FLUORIDE, ANHYDROUS
IMDG, IATA: HYDROGEN FLUORIDE, ANHYDROUS

14.3 Transport hazard class(es)

ADR: Class 8, Code: CT1
RID: Class 8, Code: CT1
IMDG: Class 8, Code 6.1
IATA: Class 8, Subrisk 6.1

14.4 Packing group

ADR, IMDG: I

14.5 Environmental hazards

Marine Pollutant No

14.6 Special precautions for user

Land transport (ADR/RID)

Warning board:	ADR/RID: Kemmler-number 886, UN number 1052
Hazard label	8+6.1
Limited quantities	LQ0
EQ	E0
Contaminated packaging: Instructions	P200
Special provisions for packing together	MP2
Portable tanks: Instructions	T10
Portable tanks: Special provisions	TP2
Tank coding	L21DH(+)
Tunnel restriction code:	C/D

Sea transport (IMDG)

EmS:	F-C, S-U
Special provisions	-
Limited quantities	None
EQ	E0
Contaminated packaging: Instructions	P200
Contaminated packaging: Provisions	-
IBC: Instructions	-

sample

IBC: Provisions	-
Tank instructions: IMO	-
Tank instructions: UN	T10
Tank instructions Provisions	TP2
Stowage and segregation	Category D. Clear of living quarters.
Properties and observations	Colourless, fuming and highly volatile liquid with an irritating and pungent odour. Highly corrosive to metals and glass in the presence of moisture. Boiling point: 20°C. Toxic if swallowed, by skin contact or by inhalation. Causes severe burns to skin, eyes and mucous membranes.

Air transport (IATA)

Passenger Ltd.Qty.:	Forbidden
Passenger:	Forbidden
Cargo:	Forbidden
Special Provisioning	A2
ERG	8P

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

No data available

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Section 15: Regulatory information

Follow national regulations

15.1. Applicable Laws or Regulations in the EU

- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), as amended
- Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances, as amended
- Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, as amended
- Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work, as amended
- COUNCIL DIRECTIVE 96/82/EC on the control of major-accident hazards involving dangerous substances as amended
- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste

15.2. Chemical Safety Assessment

- A Chemical Safety Assessment has been carried out for this substance.

Section 16: Other information

The information in this data sheet has been established to our best knowledge and was up-to-date at time of revision. It does not represent a guarantee for the properties of the product described in terms of the legal warranty regulations.

PLEASE MAKE SURE, THAT YOU RESPECT YOUR LOCAL LEGAL REQUIREMENTS WHEN USING THIS DOCUMENT AS A SAMPLE.

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