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

1.1. Product identifier

Trade name	Hydrogen fluoride
Chemical description	Hydrogen fluoride
CAS N°	7664-39-3
CE N°	231-634-8
Index N°	009-002-00-6
Registration n°	01-2119458860-33
Chemical formula	HF

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

Relevant identified uses	Industrial and professional Test gas/Calibration gas Chemical reaction / Synthesis Use for manufacture of electronic/photovoltaic components Laboratory use Contact supplier for more information on uses
Uses advised against	Consumer use not recommended

1.3. Details of the supplier of the safety data sheet

Company identification	MULTIGAS Route de l'Industrie 102 CH-1564 Domdidier
Phone number	+41 (0) 26 676 94 94
E-mail address	info@multigas.ch

1.4. Emergency telephone numbers


145 (Toxicology Centre Zurich) or +41 (0) 44 251 51 51
 +41 (0) 26 676 94 94 (Multigas)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Physical hazards	Gases under pressure : Liquefied gas	H280
Health hazards	Acute toxicity (oral), Category 2	H300

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Acute toxicity (dermal), Category 1	H310
Skin corrosion/irritation, Category 1A	H314
Serious eye damage/eye irritation, Category 1	H318
Acute toxicity (inhalation: gas) Category 2	H330

For the complete H-sentences texts mentioned in that chapter, refer to Section 16

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms			
	GHS04	GHS05	GHS06


Signal word

Hazard statements

H280	Contains gas under pressure; may explode if heated
H300	Fatal if swallowed
H310	Fatal in contact with skin
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H330	Fatal if inhaled
EUH071	Corrosive to the respiratory tract

Precautionary statements

P260	Do not breathe gas, vapours
P262	Do not get in eyes, on skin, or on clothing
P280	Wear protective gloves, protective clothing, eye protection, face protection
P303+P361+P353+P315	IF ON SKIN: (or hair) Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Get immediate medical advice / attention
P304+P340+P315	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get immediate medical advice / attention
P305+P351+P338+P315	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice / attention
P410+P403	Protect from sunlight. Store in a well-ventilated place
P405	Store locked up

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2.3. Other hazards

None

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	Product identifier	Concentration	Classification
Hydrogen fluoride	(CAS-No.) 7664-39-3 (EC-No.) 231-634-8 (EC Index-No.) 009-002-00-6 (Registration-No.) 01-2119458860-33	<= 100%	Acute Tox. 2 (Oral), H300 Acute Tox. 1 (Dermal), H310 Acute Tox. 2 (Inhalation: gas), H330 Skin Corr. 1A, H314 Eye Dam. 1, H318

For the complete H-sentences texts mentioned in that chapter, refer to Section 16

Contains no other components or impurities which will influence the classification of the product

3.2. Mixtures

Not established

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice

See a doctor. Show this safety data sheet to the attending physician

Hydrofluoric acid burns require emergency specialized medical assistance

Symptoms may not appear until 24 hours later, depending on the concentration of hydrofluoric acid. Following decontamination with water, more serious damage may occur due to the penetration or absorption of the fluoride ion

Treatment should aim to bind the fluoride ion and combat the effects of exposure. Exposed skin can be treated with a 2.5% calcium gluconate gel, repeated application, until the burning sensation ceases


More serious skin contact may require the use of subcutaneous calcium gluconate except in the finger area - unless the doctor has experience with this method - because of the risk of tissue damage caused by the increase in pressure

Absorption can easily occur through the subungual regions, which should be taken into account during decontamination

In an attempt to prevent the absorption of fluoride ion, if swallowed, give milk to conscious victim or administer chewable calcium carbonate tablets or milk of magnesia. Potential conditions, such as hypocalcaemia, hypomagnesaemia and cardiac arrhythmia, should be controlled as they are likely to occur following exposure to the product.

In case of inhalation

In case of inhalation, remove the person from the contaminated area. In case of respiratory arrest, give artificial respiration. See a doctor

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In case of skin contact	Remove contaminated clothing and shoes immediately. Wash with soap and plenty of water. Take victim immediately to hospital. See a doctor
In case of eyes contact	Rinse thoroughly with plenty of water for at least 15 minutes and consult a doctor
In case of ingestion	Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. See a doctor

4.2. Most important symptoms and effects, both acute and delayed

May cause severe chemical burns to the skin and cornea Provide first aid treatment immediately available Ask for medical advice before using the product
Destructive material of mucosal tissues and trachea. Cough, shortness of breath, headache, nausea
Refer to Section 11

4.3. Indication of any immediate medical attention and special treatment needed

Treat with corticosteroid spray as soon as possible after inhalation

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Spray water to reduce vapours or divert the cloud of steam. Water spray or water mist. Dry powder. Carbon dioxide. Foam
Unsuitable extinguishing media	Do not use water jet to extinguish

5.2. Special hazards arising from the substance or mixture

Specific hazards	In case of fire or excessive heat, hazardous combustion products may be produced Exposure to fire may cause containers to rupture/explode
Hazardous combustion products	None that are more hazardous than the product itself


5.3. Additional information

Cool endangered receptacles with water spray jet from a protected position

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Wear respiratory protection. Avoid breathing vapours, spray mists or gases. Provide adequate ventilation. Evacuate personnel to a safe place. Personal protective equipment, see section 8

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6.2. Environmental precautions

Try to stop the leak
Decrease vapour by water spray in the form of fog or fine droplets

6.3. Methods and material for containment and cleaning up

Hose down area with water
Keep area evacuated and free from ignition sources until any spilled liquid has evaporated (ground free from frost)
Wash contaminated equipment or sites of leaks with copious quantities of water

6.4. Reference to other sections

See also sections 8 and 13

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Avoid contact with skin and eyes
Avoid breathing vapour or mist
Keep away from sources of ignition - No smoking
For precautions, see section 2.2

7.2. Conditions for safe storage, including any incompatibilities

Store in a cool place. Keep container tightly closed in a dry and well-ventilated place
Content under pressure

7.3. Specific end use(s)


None

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with occupational exposure limits

Component	CAS N°	Exposure value type	Control parameter	Source
Hydrogen fluoride	7664-39-3	TWA	1 ppm	SUVA: Limit values of exposure to workstations
			0.83 mg/m ³	
		OEL	2 ppm	SUVA: Limit values of exposure to workstations
			1.66 mg/m ³	

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8.2. Exposure controls

8.2.1. Appropriate engineering controls

Provide adequate general and local exhaust ventilation
Product to be handled in a closed system
Systems under pressure should be regularly checked for leaks
Ensure exposure is below occupational exposure limits (where available)
Gas detectors should be used when toxic gases may be released

8.2.2. Individual protection measures, e.g. personal protective equipment

Eye/face protection

Wear goggles and a face shield when transfilling or breaking transfer connections
Standard EN 166 - Personal eye-protection - specifications
Provide readily accessible eye wash stations and safety showers

Skin / hand protection

Wear protective gloves when handling gas cylinders. Standard EN 388- Protective gloves against mechanical hazards Wear cold insulating gloves when transferring or disconnecting transfer lines Standard EN 511 - Insulating gloves against cold Wearing chemical resistant gloves Standard EN 374-Protective gloves against chemicals

For short-term use

Material: Chloroprene rubber
Penetration time:> 30 min
Glove thickness: 0.4 mm

For long-term use

Material: Fluoroélastomère.
Penetration time:> 480 min
Glove thickness: 0.7 mm

Consult product information of the supplier of the gloves on the compatibility of the material and its thickness

The breakthrough time of the selected gloves must be longer than the intended period of use

Have appropriate, chemical-resistant protective clothing ready for use in emergencies

Standard EN943-1 - total protective clothing against liquid, solid or gaseous chemicals

Wear safety shoes when handling bottles

Standard EN ISO 20345: Personal Protective Equipment - safety shoes

Respiratory protection

When the risk assessment shows that the use of respirable respirators is appropriate, use a full face mask with EN 14387 multipurpose cartridge. If the mask is the only means of protection, use a full face respirator. Use NIOSH (US) or CEN (EU) tested and approved equipment

8.2.3. Environmental exposure controls


Avoid any spill or leak if it can be done safely

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SECTION 9: Physical and chemical properties
9.1. Information on basic physical and chemical properties
Appearance

• Physical state at 20°C / 101.3kPa	Gas
• Colour	Colourless
Odour	No data available
Odour threshold	No data available
pH	No data available
Melting point / Freezing point	-83°C
Boiling point	19.5°C
Flash point	No data available
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Explosive limits	No data available
Vapour pressure [20°C]	1 bar
Vapour pressure [50°C]	No data available
Vapour density	No data available
Relative density, liquid (water=1)	0.97
Relative density, gas (air=1)	~1
Water solubility	Completely soluble
Partition coefficient n-octanol/water (Log Kow)	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	No data available
Oxidising properties	No data available

9.2. Other information

Molar mass	20 g/mol
Critical temperature [°C]	188°C
Relative vapour density	Considered heavier than air because of hydrogen bonding between molecules. May accumulate in confined spaces, particularly at or below ground level

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SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below

10.2. Chemical stability

Stable under recommended storage conditions

10.3. Possibility of hazardous reactions

No reactivity hazard other than the effects described in sub-sections below

10.4. Conditions to avoid

Avoid moisture in installation systems

10.5. Incompatible materials

Reacts with most metals in the presence of moisture, releasing hydrogen
 In the presence of water causes rapid corrosion of some metals. Reacts with water to form corrosive acids
 May react violently with alkalis
 Attacks glass and concrete
 For more information on compatibility, refer to ISO 11114


10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced

SECTION 11: Toxicological information

11.1. Chemical safety assessment

Acute toxicity	Fatal if inhaled Fatal in contact with skin Absorption of excessive fluorides can result in acute systemic fluorosis with hypocalcaemia, interference with various metabolic functions and organ damage (heart, liver, kidneys)
Skin corrosion/irritation	Causes severe skin burns and eye damage
Serious eye damage/irritation	Causes serious eye damage
Respiratory or skin sensitisation	No data available
Germ cell mutagenicity	No data available
Carcinogenicity	No data available
Reproductive toxicity	No data available

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STOT-single exposure – Target organ(s)	Severe corrosion to the respiratory tract at high concentrations
STOT-repeated exposure	No data available
Ingestion hazard	No data available

SECTION 12: Ecological information

12.1. Toxicity

Assessment	Classification criteria are not met
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12.2. Persistence and degradability

No data available

12.3. Bioaccumulative potential

No data available

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

PBT / vPvB assessment is not available because the chemical safety assessment is not required / is not conducted


12.6. Other adverse effects

May cause pH changes in aqueous ecological systems

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product	Burn in a chemical incinerator equipped with an afterburner and scrubber but be very careful when lighting as this product is highly flammable. Return surplus and non-recyclable solutions to a licensed waste disposal company
Contaminated container	Eliminate as unused product Contact the supplier if instructions are needed
OMoD Code	16 05 04 Gases in pressure containers containing dangerous substances

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SECTION 14: Transport information

14.1. UN number

Transport par road/rail ADR / RID	Transport by sea IMDG	Transport by air IATA
1052	1052	1052

14.2. UN proper shipping name

Transport par road/rail ADR / RID	Transport by sea IMDG	Transport by air IATA
Hydrogen fluoride, anhydrous	Hydrogen fluoride, anhydrous	Hydrogen fluoride, anhydrous

14.3. Transport hazard class(es)

Labelling



ADR/RID
IMDG
IATA

8 : Corrosive substances
6.1 : Toxic substances

14.4. Packing group

ADR/RID
IMDG
IATA

Not established

14.5. Environmental hazards

ADR/RID

None

IMDG

None

ICAO-TI / IATA-DGR

None

14.6. Special precautions for user


No data available

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

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This safety data sheet complies with the requirements of Regulation (CE) No. 1907/2006

15.2. Chemical safety assessment

A CSA has been carried out


SECTION 16: Other information

Indication of changes	Revised safety data sheet in accordance with commission regulation (EU) No 2015/830
Abbreviations and acronyms	<p>ADR : European Agreement concerning the International Carriage of Dangerous Goods by Road</p> <p>CAS : Chemical Abstract Service number (USA)</p> <p>CLP : Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008</p> <p>CSA : Chemical Safety Assessment</p> <p>EIGA : European Industrial Gases Association</p> <p>EINECS : European Inventory of Existing Commercial Chemical Substances</p> <p>EN : European Standard</p> <p>ATE : Acute Toxicity Estimate</p> <p>IATA : International Air Transport Association</p> <p>IMDG Code : International Maritime Dangerous Goods Code</p> <p>LC50 : Lethal Concentration to 50 % of a test population</p> <p>OMoD : Swiss Ordinance on the movement of waste</p> <p>PBT : Persistent, Bioaccumulative and Toxic</p> <p>PPE: Personal Protection Equipment</p> <p>REACH : Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006</p> <p>RID : Regulations concerning the international carriage of dangerous goods by rail</p> <p>RMM : Risk Management Measures</p> <p>STOT-SE : Specific Target Organ Toxicity - Single Exposure</p> <p>UN : United Nations</p> <p>vPvB : Very Persistent and Very Bioaccumulative</p> <p>WGK: Water Hazards Class</p>

Full text of H, EUH and P statements used in sections 2 and 3

Hazard statements

H280	Contains gas under pressure; may explode if heated
H300	Fatal if swallowed
H310	Fatal in contact with skin
H314	Causes severe skin burns and eye damage

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- H318 Causes serious eye damage
- H330 Fatal if inhaled
- EUH071 Corrosive to the respiratory tract

Precautionary statements

- P260 Do not breathe gas, vapours
- P262 Do not get in eyes, on skin, or on clothing
- P280 Wear protective gloves, protective clothing, eye protection, face protection
- P303+P361+P353+P315 IF ON SKIN: (or hair) Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Get immediate medical advice / attention
- P304+P340+P315 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get immediate medical advice / attention
- P305+P351+P338+P315 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice / attention
- P410+P403 Protect from sunlight. Store in a well-ventilated place
- P405 Store locked up

Disclaimer of liability

Details given in this document have been prepared based on the most available reliable documents and are believed to be correct at the time of going to press
They do not claim to be exhaustive and should be considered as a guide