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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	For industrial or professional use only

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]

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

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Acute toxicity (dermal), Category 1	H310
Skin corrosion/irritation, Category 1A	H314
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
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

2.3. Other hazards

None

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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	≥ 99%	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, hypomagnesemia 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

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

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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

The product itself does not burn
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

Avoid breathing vapours, spray mists or gases

Provide adequate ventilation

Evacuate personnel to a safe place

Personal protective equipment, see section 8

6.2. Environmental precautions

Try to stop the leak

Decrease vapour by water spray in the form of fog or fine droplets

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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	

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Provide adequate general and local exhaust ventilation

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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
Skin / hand protection	<p>Wear protective gloves when handling gas cylinders. Standard EN 388- Protective gloves against mechanical hazards</p> <p>Wear cold insulating gloves when transferring or disconnecting transfer lines Standard EN 511 - Insulating gloves against cold</p> <p>Wearing chemical resistant gloves Standard EN 374-Protective gloves against chemicals</p> <p>For long-term use Material: Fluoroelastomer Penetration time: 480 min Glove thickness: 0.7 mm</p> <p>For short-term use Material: Chloroprene rubber Penetration time: 30 min Glove thickness: 0.4 mm</p> <p>Have appropriate, chemical-resistant protective clothing ready for use in emergencies. Standard EN943-1</p>
Respiratory protection	Self-contained breathing apparatus (SCBA) or positive pressure air mask must be used in oxygenated atmospheres. Standard EN 137 - Self-contained compressed air device with a full face mask

8.2.3. Environmental exposure controls

Avoid any spill or leak if it can be done safely

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	Pungent
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

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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)	0.71
Water solubility	Completely soluble
Partition coefficient n-octanol/water (Log Kow)	-1.4
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	20.01 g/mole
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

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

Reactions with many chemical compounds
 Reacts with acids
 Reacts with organic substances
 Reacts with metals to form hydrogen
 Reacts with alkalis

10.4. Conditions to avoid

Air, lumière, émet une fumée intense dans l'air humide

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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
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

11.2 Information on other hazards

No data available

SECTION 12: Ecological information

12.1. Toxicity

Assessment	No data available
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12.2. Persistence and degradability

No data available

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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. Endocrine disrupting properties

The substance/mixture does not contain components which, in accordance with Article 57(f) of REACH or Commission Delegated Regulation (EU) 2017/2100 or Commission Delegated Regulation (EU) 2018/605 in quantities equal to or greater than 0.1%, exhibit endocrine disrupting properties

12.7. Other adverse effects

May cause pH changes in aqueous ecological systems

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product	<p>Must not be released into the atmosphere</p> <p>Burn in a chemical incinerator equipped with an afterburner and scrubber</p> <p>Return to the supplier the product not consumed in its original container</p>
Contaminated container	<p>Eliminate as unused product</p> <p>Contact the supplier if instructions are needed</p>
OMoD Code	<p>16 05 04</p> <p>Gases in pressure containers containing dangerous substances</p>

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

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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

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

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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
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

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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