SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Hydrogen fluoride, anhydrous

Issue Date:	16.01.2013	Version: 1.2	SDS No.: 000010021846
Revision Date:	05.10.2023		1/27
Last revised date :	14.02.2022		

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

1.1 Product identifier

Product name: Hydrogen fluoride, anhydrous

Additional identification

Chemical name: Hydrogen fluoride
Chemical formula: HF
INDEX No. 009-002-00-6
CAS-No. 7664-39-3
EC No. 231-634-8
REACH Registration No. 01-2119458860-33-0035

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

Identified uses: Industrial and professional. Perform risk assessment prior to use.
Use as an Intermediate (transported, on-site isolated).
Use for electronic component manufacture.
Using gas alone or in mixtures for the calibration of analysis equipment.
Using gas as feedstock in chemical processes.
Using gas for metal treatment.

Uses advised against Consumer use.

1.3 Details of the supplier of the safety data sheet

Supplier

Linde GmbH (LLC), Division Gas
Seitnerstraße 70
D-82049 Pullach

Telephone: +49 (0) 89 7446 0

E-mail: Info@de.linde-gas.com

1.4 Emergency telephone number: +44 1865 407333; opt.: +49 89 220 61012

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SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 as amended.

Health Hazards

Acute toxicity (Oral)	Category 2	H300: Fatal if swallowed.
Acute toxicity (Dermal)	Category 1	H310: Fatal in contact with skin.
Acute toxicity (Inhalation - vapor)	Category 2	H330: Fatal if inhaled.
Skin corrosion	Category 1A	H314: Causes severe skin burns and eye damage.
Serious eye damage	Category 1	H318: Causes serious eye damage.

2.2 Label Elements

Contains: Hydrogen fluoride

Signal Word: Danger

Hazard Statement(s): H300+H310+H330: Fatal if swallowed, in contact with skin or if inhaled.
H314: Causes severe skin burns and eye damage.

Precautionary Statements

General None.

Prevention: P260: Do not breathe dust/fume/gas/mist/vapors/spray.
P262: Do not get in eyes, on skin, or on clothing.
P264: Wash thoroughly after handling.
P280: Wear protective gloves/protective clothing/eye protection/face protection.

Response: P301+P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P310: Immediately call a POISON CENTER or doctor/ physician.
P304+P340: IF INHALED: Remove person to fresh air and keep 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.

Storage: P403+P233: Store in a well-ventilated place. Keep container tightly closed.

Disposal None.

Hazardous ingredients which must be listed on the label:

hydrogen fluoride

Supplemental information

EUH071: Corrosive to the respiratory tract.

2.3 Other hazards No data available.

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SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name Hydrogen fluoride
INDEX No.: 009-002-00-6
CAS-No.: 7664-39-3
EC No.: 231-634-8
REACH Registration No.: 01-2119458860-33-0035
Purity: 100%
The purity of the substance in this section is used for classification only, and does not represent the actual purity of the substance as supplied, for which other documentation should be consulted.
Trade name: -

Chemical name	Chemical formula	Concentration	CAS-No.	EC No.	REACH Registration No.	M-Factor:	Notes
Hydrogen fluoride	HF	100%	7664-39-3	231-634-8	01-2119458860-33-0035	-	#

The concentrations of the components in the SDS header, product name on page one and in section 3.2 are in mol due to regulatory requirements. All concentrations are nominal.
This substance has workplace exposure limit(s).
This substance is listed as SVHC.PBT: persistent, bioaccumulative and toxic substance.
vPvB: very persistent and very bioaccumulative substance.

SECTION 4: First aid measures

General: Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

4.1 Description of first aid measures

Inhalation: Move the exposed person to fresh air at once. If breathing stops, provide artificial respiration. Symptoms may include: Dizziness. Nausea, vomiting.

Eye contact: Rinse the eye with water immediately. Remove contact lenses, if present and easy to do. Continue rinsing. Flush thoroughly with water for at least 15 minutes. Get immediate medical assistance. If medical assistance is not immediately available, flush an additional 15 minutes.

Skin Contact: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately.

Ingestion: Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs. Get medical attention immediately.

4.2 Most important symptoms and effects, both acute and delayed: Causes severe skin burns and eye damage. May be fatal if swallowed. May be fatal if inhaled.

4.3 Indication of any immediate medical attention and special treatment needed

Hazards: Causes severe skin burns and eye damage. May be fatal if swallowed. May be fatal if inhaled.

Treatment: Do not give direct mouth-to-mouth resuscitation if swallowed. To protect rescuer, use air-viva, oxy-viva or one-way mask. Resuscitate in a well-ventilated area. If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately. Treat with a corticosteroid spray as soon as possible after inhalation. Get immediate medical advice/attention.

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SECTION 5: Firefighting measures

General Fire Hazards: Heat may cause the containers to explode.

5.1 Extinguishing media

Suitable extinguishing media: Use water spray to reduce vapors or divert vapor cloud drift. Water Spray or Fog. Dry powder. Foam. Carbon Dioxide. In case of fire in the surroundings: use appropriate extinguishing media.

Unsuitable extinguishing media: Do not use water jet as an extinguisher, as this will spread the fire.

5.2 Special hazards arising from the substance or mixture: Fire or excessive heat may produce hazardous decomposition products. Not combustible, but if involved in a fire is extremely irritating. Evolves heat when combined with water.

Hazardous Combustion Products: None that are more toxic than the product itself.

5.3 Advice for firefighters

Special fire-fighting procedures: In case of fire: Stop leak if safe to do so. Use of water may result in the formation of very toxic aqueous solutions. Keep run-off water out of sewers and water sources. Dike for water control. Continue water spray from protected position until container stays cool. Use extinguishants to contain the fire. Isolate the source of the fire or let it burn out.

Special protective equipment for fire-fighters: Gas tight chemically protective clothing (Type 1) in combination with self contained breathing apparatus.

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SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures: Evacuate area. Provide adequate ventilation. Monitor the concentration of the released product. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.

6.2 Environmental Precautions: Prevent further leakage or spillage if safe to do so. Reduce vapour with fog or fine water spray. Keep run-off water out of sewers and water sources. Dike for water control.

6.3 Methods and material for containment and cleaning up: Provide adequate ventilation. Wash contaminated equipment or sites of leaks with copious quantities of water.

6.4 Reference to other sections: Refer to sections 8 and 13.

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SECTION 7: Handling and storage:

7.1 Precautions for safe handling:

Do not handle until all safety precautions have been read and understood. Avoid exposure - obtain special instructions before use. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Refer to supplier's handling instructions. The substance must be handled in accordance with good industrial hygiene and safety procedures. Protect containers from physical damage; do not drag, roll, slide or drop. Do not remove or deface labels provided by the supplier for the identification of the container contents. When moving containers, even for short distances, use appropriate equipment eg. trolley, hand truck, fork truck etc. Provide adequate ventilation. Suck back of water into the container must be prevented. Do not allow backfeed into the container. Keep container below 50°C in a well ventilated place. Avoid suckback of water, acid and alkalis. Observe all regulations and local requirements regarding storage of containers. When using do not eat, drink or smoke. Store in accordance with local/regional/national/international regulations. Never use direct flame or electrical heating devices to raise the pressure of a container. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use.

7.2 Conditions for safe storage, including any incompatibilities:

Containers should not be stored in conditions likely to encourage corrosion. Keep away from food, drink and animal feeding stuffs. Stored containers should be periodically checked for general conditions and leakage. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible material.

Storage Class:

2A: Gases

7.3 Specific end use(s):

None.

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SECTION 8: Exposure controls/personal protection

8.1 Control Parameters

Occupational Exposure Limits

Chemical name	Type	Form of exposure	Exposure Limit Values		Source
hydrogen fluoride	TWA		1,8 ppm	1,5 mg/m3	EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended (12 2009)
	TWA		1,8 ppm	1,5 mg/m3	EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended (12 2009)
	STEL		3 ppm	2,5 mg/m3	EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended (12 2009)
	STEL		3 ppm	2,5 mg/m3	EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended (12 2009)
	MAK 2		1 ppm	0,83 mg/m3	Germany. DFG MAK List (advisory OELs). Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area (DFG), as amended (2007)
	AGW 2		1 ppm	0,83 mg/m3	TRGS 900, Occupational Exposure Limits (AGW), as amended (06 2008)

Please refer to the latest edition of the appropriate source text and consult an industrial hygienist or similar professional, or local agencies, for further information.

Exposure guidelines

Chemical name	Type	Source
hydrogen fluoride	Time Weighted Average (TWA): Indicative	EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC,

		2006/15/EC, 2009/161/EU, 2017/164/EU, as amended
	Time Weighted Average (TWA): Indicative	EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended
	Short Term Exposure Limit (STEL): Indicative	EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended
	Short Term Exposure Limit (STEL): Indicative	EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended
	Peak limitation category: Category I: substances for which the localized effect has an assigned OEL or for substances with a sensitizing effect in respiratory passages.	Germany. DFG MAK List (advisory OELs). Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area (DFG), as amended
	Exposure limit(s): If the AGW and BGW values are complied with, there should be no risk of reproductive damage (see Number 2.7).	TRGS 900, Occupational Exposure Limits (AGW), as amended
	Short Term Exposure Classification: Category I: substances for which the localized effect has an assigned OEL or for substances with a sensitizing effect in respiratory passages.	TRGS 900, Occupational Exposure Limits (AGW), as amended
	Skin designation: Can be absorbed through the skin.	TRGS 900, Occupational Exposure Limits (AGW), as amended

Biological Limit Values

Chemical Identity	Parameters / Sampling Time	Exposure Limit Values	Source
hydrogen fluoride	Fluoride Sampling time: End of shift.	8 mg/l (Urine)	EU BLV/BGV (2014)
	Fluoride Sampling time: End of shift.	8 mg/l (Urine)	EU BLV/BGV (2014)
	Fluoride Sampling time: Prior to shift.	4,0 mg/g (Creatinine in urine)	DE BGW (11 2015)

	Fluoride Sampling time: End of shift.	7,0 mg/g (Creatinine in urine)	DE BGW (11 2015)
	Fluoride Sampling time: End of shift.	8 mg/l (Urine)	EU BLV/BGV (2014)
	Fluoride Sampling time: End of shift.	8 mg/l (Urine)	EU BLV/BGV (2014)
	Fluoride Sampling time: Prior to shift.	4,0 mg/g (Creatinine in urine)	DE BGW (11 2015)
	Fluoride Sampling time: End of shift.	7,0 mg/g (Creatinine in urine)	DE BGW (11 2015)
	Fluoride Sampling time: End of shift.	8 mg/l (Urine)	EU BLV/BGV (2014)
	Fluoride Sampling time: End of shift.	8 mg/l (Urine)	EU BLV/BGV (2014)
	Fluoride Sampling time: Prior to shift.	4,0 mg/g (Creatinine in urine)	DE BGW (11 2015)
	Fluoride Sampling time: End of shift.	7,0 mg/g (Creatinine in urine)	DE BGW (11 2015)

DNEL-Values

Critical component	Type	Value	Remarks
Hydrogen fluoride	Workers - Inhalation, Systemic, long-term	1,5 mg/m3	Repeated dose toxicity
	Workers - Inhalation, Local, short-term	2,5 mg/m3	respiratory tract irritation
	Workers - Inhalation, Local, long-term	1,5 mg/m3	Repeated dose toxicity
	Workers - Inhalation, Systemic, short-term	2,5 mg/m3	respiratory tract irritation

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PNEC-Values

Critical component	Type	Value	Remarks
Hydrogen fluoride	Soil	11 mg/kg	-
Hydrogen fluoride	Aquatic (freshwater)	0,9 mg/l	-
Hydrogen fluoride	Sewage treatment plant	51 mg/l	-
Hydrogen fluoride	Aquatic (marine water)	0,09 mg/l	-

8.2 Exposure controls

Appropriate engineering controls: Consider a work permit system e.g. for maintenance activities. Ensure adequate air ventilation. Provide adequate general and local exhaust ventilation. Keep concentrations well below occupational exposure limits. Gas detectors should be used when toxic quantities may be released. Systems under pressure should be regularly checked for leakages. Product to be handled in a closed system and under strictly controlled conditions. Only use permanent leak tight installations (e.g. welded pipes). Do not eat, drink or smoke when using the product.

Individual protection measures, such as personal protective equipment

General information: A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered. Keep self contained breathing apparatus readily available for emergency use. Keep suitable chemically resistant protective clothing readily available for emergency use. Personal protective equipment for the body should be selected based on the task being performed and the risks involved. For waste disposal, see section 13 of the SDS. Protect eyes, face and skin from contact with product.

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Eye/face protection: Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes. Wear eye protection to EN 166 when using gases.

Skin protection

Hand Protection: Guideline: EN 388 Protective gloves against mechanical risks.
Additional Information: Wear working gloves while handling containers
Guideline: EN 374-1/2/3 Protective gloves against chemicals and micro-organisms.
Additional Information: Chemically resistant gloves complying with EN 374 should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Material: Fluoroelastomer.
Break-through time: > 480 min
Glove thickness: 0,7 mm

Body protection: No special precautions.

Other: Not applicable.

Respiratory Protection: Reference should be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances. The selection of the Respiratory Protective Device (RPD) must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected RPD.
Material: Filter E
Guideline: EN 14387 Respiratory protective devices. Gas filter(s) and combined filter(s). Requirements, testing, marking.
Guideline: EN 136 Respiratory protective devices. Full face masks. Requirements, testing, marking.
Guideline: EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.

Thermal hazards: Not applicable.

Hygiene measures: Obtain special instructions before use. Specific risk management measures are not required beyond good industrial hygiene and safety procedures. Do not eat, drink or smoke when using the product.

Environmental exposure controls: For waste disposal, see section 13 of the SDS.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state: liquid

Form: Liquefied gas

Color: Colorless

Odor: Strong irritating odor

Odor Threshold: Odor threshold is subjective and is inadequate to warn of over exposure.

Freezing point: -118,95 °F/-83,86 °C

Boiling Point: 67,12 °F/19,51 °C Experimental result, Weight of Evidence study

Flammability: This product is not flammable.

Upper/lower limit on flammability or explosive limits

Explosive limit - upper: Not applicable

Explosive limit - lower: Not applicable

Flash Point: Not applicable to gases and gas mixtures.

Autoignition Temperature: Not applicable.

Decomposition Temperature: When heated to decomp, emits highly corrosive fumes of hydrogen fluoride.

pH: If dissolved in water pH-value will be affected.

Viscosity

Dynamic viscosity: 0,256 mPa.s (32 °F/0 °C) Experimental result, Weight of

	Evidence study
Kinematic viscosity:	No data available.
Solubility(ies)	
Solubility in Water:	Completely Soluble
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	Not known.
Dispersion Stability:	No data available.
Vapor pressure:	122,25444 kPa (77 °F/25 °C)
Relative density:	1,002 (32 °F/0 °C)
Density:	0,97 g/l (68 °F/20 °C) Experimental result, Weight of Evidence study
Relative vapor density:	0,7
Particle characteristics:	Not applicable

9.2 Other information

Flammability:	Ki: 1,5
Molecular weight:	20,01 g/mol (HF)
VOC Content:	EC Directive 2004/42: 0,97 g/l ~100 % (calculated)
Critical Temp. (°C):	188,0 °C

SECTION 10: Stability and reactivity

10.1 Reactivity: No reactivity hazard other than the effects described in sub-section below.

10.2 Chemical Stability: Stable under normal conditions.

10.3 Possibility of hazardous reactions: No data available.

10.4 Conditions to avoid: No data available.

10.5 Incompatible Materials: Metals, water or steam [Note: Corrosive to metals. Will attack glass and concrete.]

10.6 Hazardous Decomposition Products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

General information: Absorption of excessive F- can result in acute systemic fluorosis with hypocalcaemia interference with various metabolic functions and organ damage (heart, liver, kidneys).

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity - Oral

Product	Fatal if swallowed.

Acute toxicity - Dermal

Product	Fatal in contact with skin.

Acute toxicity - Inhalation

Product	Fatal if inhaled.
Hydrogen fluoride	LC 50 (Rat, 1 h): 966 ppm

Repeated dose toxicity

Hydrogen fluoride	NOAEL (Rat(Female, Male), Inhalation, 15 d): 1 ppm(m) Inhalation Experimental result, Key study

Skin Corrosion/Irritation

Product	Causes severe burns.
Hydrogen fluoride	in vivo (Rabbit): Corrosive Experimental result, Key study

Serious Eye Damage/Eye Irritation
Product Causes serious eye damage.

Respiratory or Skin Sensitization
Product Based on available data, the classification criteria are not met.

Germ Cell Mutagenicity
Product Based on available data, the classification criteria are not met.

Carcinogenicity
Product Based on available data, the classification criteria are not met.

Reproductive toxicity
Product Based on available data, the classification criteria are not met.

Specific Target Organ Toxicity - Single Exposure
Product Based on available data, the classification criteria are not met.

Specific Target Organ Toxicity - Repeated Exposure
Product Based on available data, the classification criteria are not met.

Aspiration Hazard
Product No data available.

11.2 Information on other hazards

Endocrine disrupting properties
Product: No data available.
Components:
Hydrogen fluoride The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.;

Other information
Product: No data available.

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SECTION 12: Ecological information

12.1 Toxicity

Acute toxicity

Product No ecological damage caused by this product.

Acute toxicity - Fish

Hydrogen fluoride LC 50 (96 h): 51 mg/l Remarks: Other, Weight of Evidence study

Acute toxicity - Aquatic Invertebrates

Hydrogen fluoride EC 50 (Trichoptera aquatic larvae, 96 h): 26 - 48 mg/l (Static) Remarks: Experimental result, Key study

Toxicity to microorganisms

Hydrogen fluoride EC 50 (Alga, 72 h): 43 - 122 mg/l

Chronic Toxicity - Fish

Hydrogen fluoride NOAEL (Oncorhynchus mykiss): 4 mg/l (Static) Other, Key study

Chronic Toxicity - Aquatic Invertebrates

Hydrogen fluoride NOAEL (Daphnia magna): 3,7 mg/l (Static) Experimental result, Key study

12.2 Persistence and Degradability

Product Not applicable to gases and gas mixtures..

12.3 Bioaccumulative potential

Product The subject product is expected to biodegrade and is not expected to persist for long periods in an aquatic environment.

Bioconcentration Factor (BCF)

Hydrogen fluoride Bioconcentration Factor (BCF): 53 - 58 Aquatic sediment Other, Key study

12.4 Mobility in soil

Product Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5 Results of PBT and vPvB assessment

Product Not classified as PBT or vPvB.

Other Ecological Information

May cause pH changes in aqueous ecological systems.

12.6 Endocrine disrupting properties:

Product: No data available.

Components:

Hydrogen fluoride The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects:

Other hazards

Product: No data available.

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Other effects:

SECTION 13: Disposal considerations

13.1 Waste treatment methods

General information: Avoid discharges to atmosphere. Consult supplier for specific recommendations. Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Disposal methods: Dispose of container via supplier only. Discharge, treatment, or disposal may be subject to national, state, or local laws.

European Waste Codes

Container: 16 05 07*: discarded inorganic chemicals consisting of or containing hazardous substances

SECTION 14: Transport information

ADR

14.1 UN number or ID number:	UN 1052
14.2 UN Proper Shipping Name:	HYDROGEN FLUORIDE, ANHYDROUS
14.3 Transport Hazard Class(es)	
Class:	8
Label(s):	8, 6.1
Hazard No. (ADR):	886
Tunnel restriction code:	(C/D)
14.4 Packing Group:	I
Limited quantity	None.
Excepted quantity	None.
14.5 Environmental hazards:	Not applicable

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14.6 Special precautions for user: –

RID

14.1 UN number or ID number:	UN 1052
14.2 UN Proper Shipping Name	HYDROGEN FLUORIDE, ANHYDROUS
14.3 Transport Hazard Class(es)	
Class:	8
Label(s):	8, 6.1
14.4 Packing Group:	I
Limited quantity	None.
Excepted quantity	None.
14.5 Environmental hazards:	Not applicable
14.6 Special precautions for user:	–

IMDG

14.1 UN number or ID number:	UN 1052
14.2 UN Proper Shipping Name:	HYDROGEN FLUORIDE, ANHYDROUS
14.3 Transport Hazard Class(es)	
Class:	8
Label(s):	8, 6.1
EmS No.:	F-C, S-U
14.4 Packing Group:	I
Limited quantity	None.
Excepted quantity	None.
14.5 Environmental hazards:	Not applicable
14.6 Special precautions for user:	–

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IATA

14.1 UN number or ID number:	UN 1052
14.2 Proper Shipping Name:	Hydrogen fluoride, anhydrous
14.3 Transport Hazard Class(es):	
Class:	8
Label(s):	–
14.4 Packing Group:	I
Limited quantity	None.
Excepted quantity	None.
14.5 Environmental hazards:	Not applicable
14.6 Special precautions for user:	–
Other information	
Passenger and cargo aircraft:	Forbidden.
Cargo aircraft only:	Forbidden.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

Additional identification: Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured. Ensure that the container valve is closed and not leaking. Ensure adequate air ventilation.

SECTION 15: Regulatory information

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

EU Regulations

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According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

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EU. REACH Annex XIV, Substances Subject to Authorization as amended: None present or none present in regulated quantities.

EU. Directive 2012/18/EU (SEVESO III) on major accident hazards involving dangerous substances, Annex I:

Directive 98/24/EC on the protection of workers from the risks related to chemical agents at work:

Chemical name	CAS-No.	Concentration
Hydrogen fluoride	7664-39-3	100%

National Regulations

Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work Directive 2016/425/EEC on personal protective equipment Only products that comply with the food regulations (EC) No. 1333/2008 and (EU) No. 231/2012 and are labelled as such may be used as food additives.
This Safety Data Sheet has been produced to comply with Regulation (EU) 2020/878.

Water Hazard Class (WGK): DEWGK WGK 2: significantly water-endangering. Classification source is Annex 3.

Storage Classification: 2A: Gases

TA Luft, Technical Guidance Air: Number 5.2.2 Class III

15.2 Chemical safety assessment: No Chemical Safety Assessment has been carried out.

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SECTION 16: Other information

Revision Information: Not relevant.

Abbreviations and acronyms:

DE BGW:	TRGS 903, BGW List (Biological Limit Values), as amended
DFG MAK:	Germany. DFG MAK List (advisory OELs). Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area (DFG), as amended
ECTLV:	EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended
EU BLV/BGV:	EU. Biological Limit/Guidance Values (BLVs/BGVs), Scientific Committee on Occupational Exposure Limit Values (SCOELs), as amended
TRGS 900:	TRGS 900, Occupational Exposure Limits (AGW), as amended
DFG MAK / MAK:	Maximum allowable concentration:
ECTLV / STEL:	Short Term Exposure Limit (STEL):
ECTLV / TWA:	Time Weighted Average (TWA):
TRGS 900 / AGW:	Exposure limit(s):

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; EIGA - European Industrial Gases Association; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC -

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No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - substance of very high concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

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Key literature references and sources for data:

Various sources of data have been used in the compilation of this SDS, they include but are not exclusive to:
Agency for Toxic Substances and Diseases Registry (ATSDR) (http://www.atsdr.cdc.gov/).
European Chemical Agency: Guidance on the Compilation of Safety Data Sheets.
European Chemical Agency: Information on Registered Substances http://apps.echa.europa.eu/registered/registered-sub.aspx#search
European Industrial Gases Association (EIGA) Doc. 169 "Classification and Labelling guide", as amended.
International Programme on Chemical Safety (http://www.inchem.org/)
ISO 10156:2010 Gases and gas mixtures - Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets.
Matheson Gas Data Book, 7th Edition.
National Institute for Standards and Technology (NIST) Standard Reference Database Number 69.
The ESIS (European chemical Substances 5 Information System) platform of the former European Chemicals Bureau (ECB) ESIS (http://ecb.jrc.ec.europa.eu/esis/).
The European Chemical Industry Council (CEFIC) ERICards.
United States of America's National Library of Medicine's toxicology data network TOXNET (http://toxnet.nlm.nih.gov/index.html)
Threshold Limit Values (TLV) from the American Conference of Governmental Industrial Hygienists (ACGIH).
Substance specific information from suppliers.
Details given in this document are believed to be correct at the time of publication.

Wording of the H-statements in section 2 and 3

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.

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Training information: Users of breathing apparatus must be trained. Ensure operators understand the toxicity hazard.

Inventory Status

EU list of existing chemical substances: y

Classification according to Regulation (EC) No 1272/2008 as amended.

Acute Tox. 2, H300
Acute Tox. 1, H310
Acute Tox. 2, H330
Skin Corr. 1A, H314
Eye Dam. 1, H318

Other information: Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Ensure adequate air ventilation. Ensure all national/local regulations are observed. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

Last revised date: 05.10.2023

Disclaimer: This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.