

# SAFETY DATA SHEET

Version 3.2  
Revision Date 24.03.2020  
Supersedes Version: 3.1

SDS Number 300000002927  
Print Date 05.03.2022

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

1.1. Product identifier : Fluorine Specialty Gas Mixture

Unique formula identifier : UFI: XA38-K0TW-E009-048S

Refer to Section 3 for REACH information

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

Use of the Substance/Mixture : Industrial and professional use. Perform risk assessment prior to use.

Restrictions on Use : Not for consumer use.

1.3. Details of the supplier of the safety data sheet : Air Products Plc  
2 Millennium Gate  
Westmere Drive  
Crewe  
Cheshire

Email Address – Technical Information : GASTECH@airproducts.com

Telephone : +44(0)3457 020202

1.4. Emergency telephone number : +44(0)8085 020202  
NHS Direct in England or Wales 0845 46 47 or NHS 24 in Scotland 08454 24 24

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

Oxidizing gases - Category 1 H270:May cause or intensify fire; oxidiser.

Gases under pressure - Compressed gas. H280:Contains gas under pressure; may explode if heated.

Acute toxicity - Inhalation Category 3 H331:Toxic if inhaled.

Skin corrosion - Category 1 H314:Causes severe skin burns and eye damage.

Serious Eye Damage - Category 1 H318:Causes serious eye damage.

### 2.2. Label elements

Hazard pictograms/symbols

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Signal Word: Danger

## Hazard Statements:

H270: May cause or intensify fire; oxidiser.  
H280: Contains gas under pressure; may explode if heated.  
H314: Causes severe skin burns and eye damage.  
H331: Toxic if inhaled.  
EUH071: Corrosive to the respiratory tract.

## Precautionary Statements:

Prevention	: P220: Keep away from clothing and other combustible materials. P244: Keep valves and fittings free from oil and grease. P260: Do not breathe dust/fume/gas/mist/vapours/spray. P280: Wear protective gloves/protective clothing/eye protection/face protection.
Response	: P303+P361+P353 :IF ON SKIN (or hair): 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. P315 :Get immediate medical advice/attention. P370+P376 :In case of fire: Stop leak if safe to do so.
Storage	: P403: Store in a well-ventilated place. P405: Store locked up.

## 2.3. Other hazards

Very toxic by inhalation.  
Use a back flow preventative device in the piping.  
Use equipment rated for cylinder pressure.  
Close valve after each use and when empty.  
Read and follow the Safety Data Sheet (SDS) before use.  
Sharp, pungent odor that can be detected at very low levels.  
Can cause severe burns if inhaled or upon skin contact.  
Use only with equipment of compatible materials of construction, rated for cylinder pressure.  
Use only with equipment cleaned for oxygen service and rated for cylinder pressure.  
Open valve slowly.  
Extremely reactive.  
Corrosive to respiratory tract  
High pressure, oxidizing gas.  
Vigorously accelerates combustion.  
Keep oil, grease, and combustibles away.  
May react violently with combustible materials.  
Extremely reactive.

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May react violently with water.  
Do not breathe gas.  
Corrosive to eyes, respiratory system and skin.  
Wear self-contained breathing apparatus and protective suit.  
Mixture does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

## Environmental Effects

Dangerous for the environment.

## SECTION 3: Composition/information on ingredients

3.1. Substances : Not applicable.

### 3.2. Mixtures

Components	EINECS / ELINCS Number	CAS Number	Concentration (Volume)
Fluorine	231-954-8	7782-41-4	10 %
Nitrogen	231-783-9	7727-37-9	90 %

Components	Classification (CLP)	REACH Reg. #
Fluorine	Press. Gas (Comp.) ;H280 Acute Tox. Inha 2 ;H330 Eye Dam. 1 ;H318 Ox. Gas 1 ;H270 Skin Corr. 1A ;H314	01-2120759325-50
Nitrogen	Press. Gas (Comp.) ;H280	*1

\*1: Listed in Annex IV / V REACH, exempted from registration.

\*2: Registration not required: substance manufactured or imported < 1 t/y.

\*3: Registration not required: substance manufactured or imported < 1 t/y for non-intermediate uses.

Refer to section 16 for full text of each relevant hazard statement (H).

Concentration is nominal. For the exact product composition, please refer to technical specifications.

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

- General advice : The potential for hydrogen fluoride formation exists with every exposure, therefore its toxicity must also be considered. If additional information is needed consult the Safetygram – “Medical treatment Protocol for Hydrofluoric Acid Burns” available on the company website.  
Prompt medical attention is required in all cases of exposure. Remove victim to uncontaminated area wearing self-contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
- Eye contact : Seek medical treatment immediately. Irrigate eye intermittently for 20 minutes with an aqueous calcium gluconate 1% solution, if available. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
Keep eye wide open while rinsing.
- Skin contact : A physician should be consulted for all exposures . Alternative treatment is to

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soak the affected areas in an iced 0.13% water solution (1:750) of Zephiran® chloride (benzalkonium chloride solution, NF). Use ice cubes, not shaved ice, to prevent frostbite. If soaking is impractical, soaks or compresses may be used. (Do not use Zephiran® for burns of the eye.) Burns covering an area greater than eight square inches require immediate treatment by a physician. If immersion is impractical, soaked compresses of the same solution should be applied to the area. Immersion or compresses must be used continuously for two hours. With gloved hand apply 2.5% calcium gluconate gel to the burn area. Burns covering an area greater than 25 square centimeters (4 square inches) require immediate treatment by a medical doctor. Remove contaminated clothing. Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and badly. Flush with copious amounts of water until treatment is available.

- Ingestion : Ingestion is not considered a potential route of exposure.
- Inhalation : As soon as possible give 2.5% to 3% calcium gluconate solution by nebulizer. Move to fresh air. In case of shortness of breath, give oxygen. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. Mouth to mouth resuscitation is not recommended. If unconscious place in recovery position and seek medical advice. Consult a doctor.

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

- Symptoms : No data available.

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

- Treatment : Individuals with anemia or pre-existing kidney, heart, liver or nervous system disease may be at increased risk. If pain persists after above topical treatments, it may be necessary to inject 5% aqueous calcium gluconate beneath, around and into the burn area. This will more likely be necessary in the treatment of extensive burns or small burns where treatment has been delayed. Do not use local anesthetics. Resolution of pain is means to determine effective medical treatment. The patient should be observed for clinical symptoms of hypocalcemia following ingestion or inhalation or following extensive burns. Serum calcium, potassium and magnesium determinations must be performed immediately and periodically to monitor for hypocalcemia and electrolyte imbalance. EKGs should be done immediately and periodically to monitor for arrhythmias, hypocalcemia and hyperkalemia. If additional information is needed, consult the Safetygram "Treatment Protocol for Hydrofluoric Acid Burns available on our website. If exposed or concerned: Get medical attention/advice.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

- Suitable extinguishing media : None. The product itself does not burn. Use extinguishing media appropriate for surrounding fire.
- Extinguishing media which must not be used for safety reasons. : Most common media will react with product and will not extinguish the fire. Do not use water jet to extinguish.

- 5.2. Special hazards : Upon exposure to intense heat or flame, cylinder will vent rapidly and or rupture

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arising from the  
substance or mixture

violently. Oxidant. Strongly supports combustion. May react violently with combustible materials. Some materials which are noncombustible in air may burn in the presence of an oxidizer. Use of water may result in the formation of very toxic aqueous solutions. Move away from container and cool with water from a protected position. Keep containers and surroundings cool with water spray. Do not allow run-off from firefighting to enter drains or water courses. If possible, stop flow of product.

- 5.3. Advice for firefighters : Use self-contained breathing apparatus and chemically protective clothing. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. EN 943-2: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Gas-tight chemical protective suits for emergency teams.

## SECTION 6: Accidental release measures

- 6.1. Personal precautions, protective equipment and emergency procedures : Evacuate personnel to safe areas. Use self-contained breathing apparatus or positive pressure air line with mask and escape pack in areas where concentration is unknown or above the exposure limits. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ventilate the area.
- 6.2. Environmental precautions : Should not be released into the environment. Prevent further leakage or spillage if safe to do so.
- 6.3. Methods and material for containment and cleaning up : Ventilate the area. Approach suspected leak areas with caution.
- Additional advice : Large releases may require considerable downwind evacuation. If possible, stop flow of product. If leak is from cylinder or cylinder valve, call the emergency telephone number. If the leak is in the user's system, close the cylinder valve, safely vent the pressure, and purge with an inert gas before attempting repairs. Increase ventilation to the release area and monitor concentrations.
- 6.4. Reference to other sections : For more information refer to Sections 8 & 13

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Carbon steel, stainless steel or copper are suitable materials of construction. Any equipment that uses this product must be first thoroughly cleaned, rinsed with solvent, and dried. The equipment should then be treated (passivated) with increasing concentrations and/or pressures of fluorine as a final cleaning process. This treatment or passivation process, will allow the fluorine to react with and eliminate any impurities without ignition of equipment and will impart a protective fluoride surface layer. (Contact your supplier for proper passivation procedures.) Monel and nickel are preferred materials for high temperature applications. Inexperienced or first time users of product should contact supplier for additional information on the storage, handling and use of this product. Lead is the preferred gasket material. Systems that contain moisture may form hydrofluoric acid. To initially limit the amount of gas in the system introduce it in steps by opening and closing the valves in succession.

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Systems that use fluorine may, over time, become contaminated with powder residue. This material is composed of metal fluorides and should be handled with caution as it may contain small amounts of hydrofluoric acid. Further information on Fluorine can be found on our web site at <http://www.airproducts.com/productstewardship/> or by contacting supplier. Only experienced and properly instructed persons should handle compressed gases/cryogenic liquids. Protect cylinders from physical damage; do not drag, roll, slide or drop. Do not allow storage area temperature to exceed 50°C (122°F). Before using the product, determine its identity by reading the label. Know and understand the properties and hazards of the product before use. When doubt exists as to the correct handling procedure for a particular gas, contact the supplier. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. 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. Use an adjustable strap wrench to remove over-tight or rusted caps. Before connecting the container, check the complete gas system for suitability, particularly for pressure rating and materials. Before connecting the container for use, ensure that back feed from the system into the container is prevented. Ensure the complete gas system is compatible for pressure rating and materials of construction. Ensure the complete gas system has been checked for leaks before use. Employ suitable pressure regulating devices on all containers when the gas is being emitted to systems with lower pressure rating than that of the container. Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur. Open valve slowly. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Close valve after each use and when empty. Replace outlet caps or plugs and container caps as soon as container is disconnected from equipment. Do not subject containers to abnormal mechanical shock. Never attempt to lift a cylinder by its valve protection cap or guard. Do not use containers as rollers or supports or for any other purpose than to contain the gas as supplied. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit. Keep container valve outlets clean and free from contaminants particularly oil and water. Do not smoke while handling product or cylinders. Never re-compress a gas or a gas mixture without first consulting the supplier. Never attempt to transfer gases from one cylinder/container to another. Always use backflow protective device in piping. Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service. Avoid suckback of water, acid and alkalis. Installation of a cross purge assembly between the cylinder and the regulator is recommended. When returning cylinder install valve outlet cap or plug leak tight. Never permit oil, grease, or other readily combustible substances to come into contact with valves or containers containing oxygen or other oxidants. Do not use rapidly opening valves (e.g. ball valves). Open valve slowly to avoid pressure shock. Never pressurize the entire system at once. Use only with equipment cleaned for oxygen service and rated for cylinder pressure. Never use direct flame or electrical heating devices to raise the pressure of a container. Containers should not be subjected to temperatures above 50°C (122°F).

## 7.2. Conditions for safe storage, including any incompatibilities

Containers should be stored in the vertical position and properly secured to prevent toppling. The container valves should be tightly closed and where appropriate valve outlets should be capped or plugged. Container valve guards or caps should be in place. Full containers should be stored so that oldest stock is used first. Keep containers tightly closed in a cool, well-ventilated place. Stored containers should be periodically checked for general condition and leakage. Observe all regulations and local requirements regarding storage of containers. Local codes may have special requirements for toxic gas storage. Protect containers stored in the open against rusting and extremes of weather. Containers should not be stored in conditions likely to encourage corrosion. Containers should be stored in a purpose build compound which should be well ventilated, preferably in the open air. Keep container tightly closed in a dry and well-ventilated place. Full and empty cylinders should be segregated. Do not allow storage temperature to exceed 50°C (122°F). Display "No Smoking or Open Flames" signs in the storage areas. Return empty containers in a timely manner.

## Technical measures/Precautions

Containers should be segregated in the storage area according to the various categories (e.g. flammable, toxic, etc.) and in accordance with local regulations. Keep away from combustible material. Where necessary containers containing oxygen and oxidants should be separated from flammable gases by a fire resistant partition. Segregate from flammable gases and other flammable materials in store.

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## 7.3. Specific end use(s)

Refer to section 1 or the extended SDS if applicable.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Exposure limit(s)

Fluorine	Time Weighted Average (TWA)	1 ppm	1.58 mg/m3	EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended
Fluorine	Short Term Exposure Limit (STEL)	2 ppm	3.16 mg/m3	EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended
Fluorine	Time Weighted Average (TWA)	1 ppm	1.6 mg/m3	UK. EH40 Workplace Exposure Limits (WELs), as amended
Fluorine	Short Term Exposure Limit (STEL)	1 ppm	1.6 mg/m3	UK. EH40 Workplace Exposure Limits (WELs), as amended
Fluorine	Time Weighted Average (TWA)	1 ppm	1.58 mg/m3	EU. Scientific Committee on Occupational Exposure Limit Values (SCOELs), European Commission - SCOEL, as amended
Fluorine	Short Term Exposure Limit (STEL)	2 ppm	3.16 mg/m3	EU. Scientific Committee on Occupational Exposure Limit Values (SCOELs), European Commission - SCOEL, as amended

If applicable, refer to the extended section of the SDS for further information on CSA.

DNEL: Derived no effect level (Workers)

Components

Fluorine	Acute - local effects, inhalation	3.16 mg/m3
Fluorine	Acute - systemic effects, inhalation	3.16 mg/m3
Fluorine	Long-term - local effects, inhalation	1.58 mg/m3
Fluorine	Long-term - systemic effects, inhalation	1.58 mg/m3

PNEC: predicted no effect concentration

Components

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Fluorine	Aqua (freshwater)	0.9 mg/l
Fluorine	Aqua (marine water)	0.9 mg/l
Fluorine	Sediment (freshwater)	3.52 mg/kg
Fluorine	Sediment (marine water)	3.52 mg/kg
Fluorine	Soil	11 mg/kg
Fluorine	Sewage treatment plant	51 mg/l

## 8.2. Exposure controls

### Engineering measures

Provide natural or mechanical ventilation to prevent accumulation above exposure limits.  
Provide readily accessible eye wash stations and safety showers.

### Personal protective equipment

- Respiratory protection : Keep self-contained breathing apparatus readily available for emergency use.  
Users of breathing apparatus must be trained. Use gas filters and full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers. Gas filters do not protect against oxygen deficiency. Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known. Standard EN 14387 - Gas filter(s), combined filter(s) and full face mask - EN 136. Consult respiratory device supplier's product information for the selection of the appropriate device.  
Self-contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
- Hand protection : Wear work gloves when handling gas containers.  
Standard EN 388 - Protective gloves against mechanical risk.  
Wear chemically resistant protective gloves.  
Standard EN 374 - Protective gloves against chemicals.  
Consult glove manufacturer's product information on material suitability and material thickness.  
The breakthrough time of the selected gloves must be greater than the intended use period.  
Gloves must be clean and free of oil and grease.
- Eye/face Protection : Wear safety glasses with side shields.  
Wear goggles and a face shield when transfilling or breaking transfer connections.  
Standard EN 166 - Personal eye-protection.
- Skin and body protection : Direct contact with high concentrations of this product can react with and may ignite most materials used for personal protective equipment.  
Loose fitting leather gloves and jacket when connecting, disconnecting or opening cylinder valve.  
Safety shoes are recommended when handling cylinders.  
Standard EN ISO 20345 - Personal protective equipment - Safety footwear.  
Keep suitable chemically resistant protective clothing readily available for emergency use.  
Standard EN943-1 - Full protective suits against liquid, solid and gaseous chemicals.
- Special instructions for protection and hygiene : Ensure adequate ventilation, especially in confined areas. Provide good ventilation and/or local exhaust to prevent accumulation of concentrations above



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exposure limits.

Environmental Exposure Controls : If applicable, refer to the extended section of the SDS for further information on CSA.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

- (a/b) Physical state/Colour : Compressed gas. Colorless gas
- (c) Odour : Mixture contains one or more component(s) which have the following odor: No odor warning properties. Pungent.
- (d) Density : 0.0012 g/cm<sup>3</sup> (0.075 lb/ft<sup>3</sup>) Note: (as vapor)
- (e) Relative Density : 1.6056 (water = 1)
- (f) Melting point / freezing point : No data available.
- (g) Boiling point/range : -319 °F (-194.89 °C)
- (h) Vapor pressure : No data available.
- (i) Water solubility : Not known, but considered to have low solubility.  
Reacts violently with water.
- (j) Partition coefficient:  
n-octanol/water [log Kow] : Not known.
- (k) pH : Not applicable for gases and gas mixtures.
- (l) Viscosity : No reliable data available.
- (m) Particle characteristics : Not applicable for gases and gas mixtures.
- (n) Upper and lower explosion /  
flammability limits : Non flammable.
- (o) Flash point : Not applicable for gases and gas mixtures.
- (p) Autoignition temperature : Non flammable.
- (q) Decomposition  
temperature : Not applicable.

### 9.2. Other information

- Explosive properties : Not applicable.
- Oxidizing properties : No data available.
- Molecular Weight : 28.9 g/mol

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Odor threshold	: Odour threshold is subjective and inadequate to warn of overexposure.
Evaporation rate	: Not applicable for gases and gas mixtures.
Flammability (solid, gas)	: Refer to product classification in Section 2
Specific Volume	: 13.28 m <sup>3</sup> /kg (212.75 ft <sup>3</sup> /lb)
Relative vapor density	: 1.00 (air = 1) Lighter or similar to air.

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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 normal conditions.
10.3. Possibility of hazardous reactions	: Can react with water and form oxygen difluoride and hydrogen oxyfluoride. Violently oxidises organic material.
10.4. Conditions to avoid	: No data available.
10.5. Incompatible materials	: Water. Brass. Viton, Buna-N or Neoprene elastomers. Alcohols. Reacts energetically with water. Reaction with water or contaminants or excessive heat may result in sufficient pressure to burst container. Flammable materials. Organic materials. Avoid oil, grease and all other combustible materials.
10.6. Hazardous decomposition products	: No data available.

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## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

#### Likely routes of exposure

Effects on Eye	: Causes severe eye burns.
Effects on Skin	: Causes skin burns.
Inhalation Effects	: May be fatal if inhaled. Irritating to respiratory system. Can cause severe lung damage. Delayed adverse effects possible. Prolonged exposure to small concentrations may result in pulmonary edema. Delayed fatal pulmonary edema possible.
Ingestion Effects	: No data available.

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Symptoms : No data available.

## Acute toxicity

Acute Oral Toxicity : No data is available on the product itself.

Acute Inhalation Toxicity : No data is available on the product itself.

## Components

Fluorine

LC50 (1 h) : 185 ppm

Species : Rat.

Acute Dermal Toxicity : No data is available on the product itself.

Skin corrosion/irritation : No data available.

Serious eye damage/eye irritation : No data available.

Sensitization. : No data available.

## Chronic toxicity or effects from long term exposures

Carcinogenicity : No data available.

Reproductive toxicity : No data is available on the product itself.

Germ cell mutagenicity : No data is available on the product itself.

Specific target organ systemic toxicity (single exposure) : Teeth and bone. Eyes. Lungs. Kidney. Liver. Heart. Acute or chronic respiratory conditions. Asthma.

Specific target organ systemic toxicity (repeated exposure) : Animals exposed to hydrogen fluoride have exhibited kidney, lung, heart and liver damage. Direct toxicity of this material may be accompanied by fluoride absorption and systemic depletion of calcium ion, an essential electrolyte. Chronic exposure may cause abnormal calcification in the bone structure (fluorosis) due to low level systemic absorption of fluoride. Fluoride toxicity from acute inhalation exposure to this product is unlikely due to the noxious and corrosive nature of this gas. Death from respiratory tract damage would likely occur before significant amounts of fluoride are absorbed. The potential for hydrogen fluoride formation exists with every exposure; therefore, its toxicity must also be considered. Chronic fluoride exposure may cause bone or joint changes in humans (fluorosis).

Aspiration hazard : No data available.

## SECTION 12: Ecological information

### 12.1. Toxicity

Aquatic toxicity : May cause pH changes in aqueous ecological systems. May cause pH changes in aqueous ecological systems.

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Toxicity to other organisms : No data is available on the product itself.

## 12.2. Persistence and degradability

No data available.

## 12.3. Bioaccumulative potential

Refer to Section 9 "Partition Coefficient (n-octanol/water)".

## 12.4. Mobility in soil

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

## 12.5. Results of PBT and vPvB assessment

If applicable, refer to the extended section of the SDS for further information on CSA.

## 12.6. Other adverse effects

This product has no known eco-toxicological effects.

Effect on the ozone layer	:	No known effects from this product.
Ozone Depleting Potential	:	None

Effect on global warming	:	No known effects from this product.
Global Warming Potential	:	None

## SECTION 13: Disposal considerations

13.1. Waste treatment methods : The flow rate of the gas must be controlled to prevent overheating the disposal unit. Do not use water. A five to fifteen percent (by weight in water) solution of potassium hydroxide is a common liquid scrubbing medium. Do not attempt to dispose of residual or unused quantities. Small quantities may be disposed by slowly flowing gas in to a caustic liquid or solid scrubber. Soda lime, a sodium hydroxide-calcium oxide mixture, or calcium carbonate are suitable solid scrubber media. Do not use activated carbon or charcoal as a disposal media. Doing so may cause an explosive reaction. In accordance with local and national regulations. Contact supplier if guidance is required. Return unused product in original cylinder to supplier. Must not be discharged to atmosphere. Refer to the EIGA code of practice Doc. 30 "Disposal of Gases", downloadable at <http://www.eiga.org> for more guidance on suitable disposal methods. List of hazardous waste codes: 16 05 04\*: gases in pressure containers (including halons) containing hazardous substances.

Contaminated packaging : Return cylinder to supplier.

## SECTION 14: Transport information

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## 14.1. UN number

UN/ID No. : UN3306

## 14.2. UN proper shipping name

Transport by road/rail (ADR/RID) : COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.,  
(Fluorine, Nitrogen)  
Transport by air (ICAO-TI / IATA-DGR) : Compressed gas, toxic, oxidizing, corrosive, n.o.s., (Fluorine,  
Nitrogen)  
Transport by sea (IMDG) : COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.,  
(Fluorine, Nitrogen)

## 14.3. Transport hazard class(es)

Label(s) : 2.3 (5.1, 8)

Transport by road/rail (ADR/RID)  
Class or Division : 2  
ADR/RID Hazard ID no. : 265  
Tunnel Code : (C/D)

Transport by sea (IMDG)  
Class or Division : 2.3

## 14.4. Packing group

Transport by road/rail (ADR/RID) : Not applicable.  
Transport by air (ICAO-TI / IATA-DGR) : Not applicable.  
Transport by sea (IMDG) : Not applicable.

## 14.5. Environmental hazards

Transport by road/rail (ADR/RID)  
Marine Pollutant : No

Transport by air (ICAO-TI / IATA-DGR)  
Marine Pollutant : No

Transport by sea (IMDG)  
Marine Pollutant : No  
Segregation Group : None

## 14.6. Special precautions for user

Transport by air (ICAO-TI / IATA-DGR)  
Passenger and Cargo Aircraft : Transport forbidden  
Cargo Aircraft only : Transport forbidden

Transport by sea (IMDG)

\* NOTE: This product contains a USDOT Hazardous Substance and will meet the Reportable Quantity definition when shipped to, from, or within the United States, in the amount specified in 49CFR 172.101 Appendix A.

### Further Information

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

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emergency. The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact customer service.

## 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

Country	Regulatory list	Notification
USA	TSCA	Included on Inventory.
EU	EINECS	Included on Inventory.
Canada	DSL	Included on Inventory.
Australia	AICS	Included on Inventory.
South Korea	ECL	Included on Inventory.
China	SEPA	Included on Inventory.
Philippines	PICCS	Included on Inventory.
Japan	ENCS	Included on Inventory.

#### Other Regulations

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), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Regulation (EC) No 1272/2008 the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

Control of Substances Hazardous to Health Regulations 2002 (as amended)

Health and Safety at Work etc. Act 1974

Management of Health and Safety at Work Regulations (Northern Ireland) 2000 c.388, and as amended

Management of Health and Safety at Work Regulations 1999 (S.I. number 3242)

The Health and Safety at Work etc. Act 1974 (Application to Environmentally Hazardous Substances) Regulations 2002 (England and Wales and Scotland) 11 March 2002 c.282, and as amended

Health and Safety at Work Order (Application to Environmentally Hazardous Substances) Regulations (Northern Ireland) 2003 (Northern

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Ireland) 14 March 2003 c52, and as amended

The Control of Major Accident Hazards Regulations 2015 c483

The Control of Major Accident Hazards Regulations (Northern Ireland) 2015 c325

The Pressure Systems Safety Regulations 2000 (S.I. number 128) link to Pressure Equipment Directive (97/23/EC)

The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2011 c1885, and as amended

The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations with amendments (Northern Ireland) 2011 c365

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 c.407

The Water Environment Regulations (Northern Ireland) 2017 c.81

Pollution Prevention and Control Act 1999 c.24

The Fluorinated Greenhouse Gases Regulations 2015 c.310

The Fluorinated Greenhouse Gases Regulations (Northern Ireland) 2015 c.425

The Acetylene Safety (England and Wales and Scotland) Regulations 2014 c.1639

The Highly Flammable Liquids and Liquefied Petroleum Gases Regulations 1972 c.917

The Highly Flammable Liquids and Liquefied Petroleum Gases Regulations (Northern Ireland) 1975 c.256

Dangerous Substances and Explosive Atmospheres Regulations (Northern Ireland) 2003 c.152

The Dangerous Substances and Explosive Atmospheres Regulations 2002 c.2776

Pollution Prevention and Control Act 1999

The Environmental Permitting (England and Wales) Regulations 2016

Ozone Depleting Substances Regulations 2015

## 15.2. Chemical safety assessment

A CSA does not need to be carried out for this product.

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## SECTION 16: Other information

Ensure all national/local regulations are observed.

### Hazard Statements:

H270 May cause or intensify fire; oxidiser.  
H280 Contains gas under pressure; may explode if heated.  
H314 Causes severe skin burns and eye damage.  
H318 Causes serious eye damage.  
H330 Fatal if inhaled.

### Indication of Method:

Oxidizing gases Category 1 May cause or intensify fire; oxidiser. Calculation method

Gases under pressure Compressed gas. Contains gas under pressure; may explode if heated. On basis of test data.

Acute toxicity Category 3 Toxic if inhaled. On basis of test data.

Skin corrosion Category 1 Causes severe skin burns and eye damage. Calculation method

Serious Eye Damage Category 1 Causes serious eye damage. Calculation method

### Abbreviations and acronyms:

ATE - Acute Toxicity Estimate  
CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008  
REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006  
EINECS - European Inventory of Existing Commercial Chemical Substances  
ELINCS - European List of Notified Chemical Substances  
CAS# - Chemical Abstract Service number  
PPE - Personal Protection Equipment  
Kow - octanol-water partition coefficient  
DNEL - Derived No Effect Level  
LC50 - Lethal Concentration to 50 % of a test population  
LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose)  
NOEC - No Observed Effect Concentration  
PNEC - Predicted No Effect Concentration  
RMM - Risk Management Measure  
OEL - Occupational Exposure Limit  
PBT - Persistent, Bioaccumulative and Toxic  
vPvB - Very Persistent and Very Bioaccumulative  
STOT - Specific Target Organ Toxicity  
CSA - Chemical Safety Assessment  
EN - European Standard  
UN - United Nations  
ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road  
IATA - International Air Transport Association  
IMDG - International Maritime Dangerous Goods  
RID - Regulations concerning the International Carriage of Dangerous Goods by Rail  
WGK - Water Hazard Class

### Key literature references and sources for data:

ECHA - Guidance on the compilation of safety data sheets  
ECHA - Guidance on the application of the CLP Criteria



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ARIEL database

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For additional information, please visit our Product Stewardship web site at  
<http://www.airproducts.com/productstewardship/>

This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws. COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Details given in this document are believed to be correct at the time of going to press. 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.

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