

Safety Data Sheet

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MSDS Nr : 350-00-0002BOC(A)	Version : 1.01	Date : 29/11/2006
		Replaces version dated : 29/07/1994

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

Product name	Fluorine
Chemical formula	F2
Company identification	see heading and/or footer
Emergency phone numbers	see heading and/or footer

2 COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Preparation	Substance.
Components/Impurities	Contains no other components or impurities which will influence the classification of the product.
CAS Nr	7782-41-4
EC Nr (from EINECS)	231-954-8

3 HAZARDS IDENTIFICATION

Hazards identification	Very toxic by inhalation. Very corrosive to eyes, respiratory system and skin. Oxidant. Strongly supports combustion. May react violently with combustible materials. Compressed gas
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4 FIRST AID MEASURES

Inhalation	Very toxic by inhalation. Delayed adverse effects possible. Prolonged exposure to small concentrations may result in pulmonary oedema. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
Skin/eye contact	May cause severe chemical burns to skin and cornea. Suitable first-aid treatment should be immediately available. Seek medical advice before using product. Obtain medical assistance Remove contaminated clothing. Drench affected area with water for at least 15 minutes Immediately flush eyes thoroughly with water for at least 15 minutes. In case of skin contact, wearing rubber gloves rub 2.5% calcium gluconate gel continuously into the affected area for 1.5 hours or until further medical care is available.
Ingestion	Ingestion is not considered a potential route of exposure.

5 FIRE FIGHTING MEASURES

Specific hazards	Non flammable Exposure to fire may cause containers to rupture/explode. Supports combustion.
Hazardous combustion products	None that are more toxic than the product itself.
Suitable extinguishing media	Carbon dioxide.
Specific methods	If possible, stop flow of product. Move away from the container and cool with water from a protected position.

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Special protective equipment for fire fighters Use self-contained breathing apparatus and chemically protective clothing.

6 ACCIDENTAL RELEASE MEASURES

Personal precautions	Evacuate area. Use self-contained breathing apparatus and chemically protective clothing. Eliminate ignition sources. Ensure adequate air ventilation.
Environmental precautions	Try to stop release. Reduce vapour with fog or fine water spray. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
Clean up methods	Ventilate area. Wash contaminated equipment or sites of leaks with copious quantities of water. Hose down area with water.

7 HANDLING AND STORAGE

Handling and storage	Use no oil or grease. Passivate all equipment and pipework before introducing gas. Contact supplier for passivation procedure. Open valve slowly to avoid pressure shock. Segregate from flammable gases and other flammable materials in store. Suck back of water into the container must be prevented. Do not allow backfeed into the container. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Refer to supplier's container handling instructions. Keep container below 50°C in a well ventilated place.
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8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit value for country	UK: Fluorine - LTEL:1ppm; STEL:1ppm (EH40/2005) Germany: Fluorine - MAK: 0.1ppm France: Fluorine - VLE: 1ppm
Personal protection	Ensure adequate ventilation. Do not smoke while handling product. Keep self contained breathing apparatus readily available for emergency use. Keep suitable chemically resistant protective clothing readily available for emergency use.

9 PHYSICAL AND CHEMICAL PROPERTIES

Molecular weight	38
Melting point	-220 °C
Boiling point	-188 °C

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Critical temperature	-129 °C
Relative density, gas	1.3 (air=1)
Relative density, liquid	1.5 (water=1)
Vapour Pressure 20°C	Not applicable.
Solubility mg/l water	No reliable data available.
Appearance/Colour	Pale yellow gas
Odour	Pungent
Flammability range	Oxidiser.
Autoignition temperature	Not applicable
Other data	Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

10 STABILITY AND REACTIVITY

Stability and reactivity	May react violently with combustible materials Reacts with water to form corrosive acids. May react violently with alkalis. With water causes rapid corrosion of some metals. May react violently with reducing agents. Violently oxidises organic material.
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11 TOXICOLOGICAL INFORMATION

General	Absorption of excessive F- can result in acute systemic fluorosis with hypocalcemia, interference with various metabolic functions and organ damage (heart, liver, kidneys).
LC50/1h (ppm)	185 ppm

12 ECOLOGICAL INFORMATION

General	May cause pH changes in aqueous ecological systems.
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13 DISPOSAL CONSIDERATIONS

General	Avoid discharge to atmosphere. Do not discharge into any place where its accumulation could be dangerous. Gas may be scrubbed in alkaline solution under controlled conditions to avoid violent reaction. Contact supplier if guidance is required.
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14 TRANSPORT INFORMATION

Proper shipping name	FLUORINE, COMPRESSED
UN Nr	1045
Class	2
ADR/RID Classification code	1TOC
Packing group	None

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Labelling ADR	Label 2.3: toxic substance. Label 5.1: fire intensifying risk. Label 8: corrosive substance.
IMDG EmS codes	F-C, S-W
IMDG Marine pollutant	No
IATA passenger packing instruction	Forbidden
IATA passenger max. quantity/pack	Forbidden
IATA cargo packing instruction	Forbidden
IATA cargo max. quantity/pack	Forbidden
Other transport 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 emergency. Before transporting product containers ensure that they are firmly secured and: - cylinder valve is closed and not leaking - valve outlet cap nut or plug (where provided) is correctly fitted - valve protection device (where provided) is correctly fitted - there is adequate ventilation. - compliance with applicable regulations.

15 REGULATORY INFORMATION

Number in Annex I of Dir 67/548	009-001-00-0.
EC Classification	R7 T+;R26 C;R35
-Symbols	T+: Very toxic C: Corrosive
Labelling of cylinders	
-Symbols	Label 2.3: toxic substance. Label 5.1: fire intensifying risk. Label 8: corrosive substance.
-Risk phrases	R7 May cause fire. R26 Very toxic by inhalation. R35 Cause severe burns (eyes, respiratory system and skin).
-Safety phrases	S1 Keep locked up. S9 Keep container in well ventilated place. S17 Keep away from combustible material. S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36/37/39 Wear suitable protective clothing, gloves and eye/face protection. S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

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16 OTHER INFORMATION

Ensure all national/local regulations are observed.

Ensure operators understand the toxicity hazard.

Users of breathing apparatus must be trained.

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

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.

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.

End of document.

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