





# SAFETY DATA SHEET

Page : 2 / 5

Revised edition no : 1

Date : 15/7/2005

Supersedes : 0/0/0

## Fluorine

## AL057

### 5 FIRE-FIGHTING MEASURES

- Flammable class** : Non flammable.
- Specific hazards** : Exposure to fire may cause containers to rupture/explode.  
Supports combustion.
- Hazardous combustion products** : None that are more toxic than the product itself.
- Extinguishing media**
- **Suitable extinguishing media** : All known extinguishants can be used.
- Specific methods** : If possible, stop flow of product.  
Move away from the container and cool with water from a protected position.
- 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.  
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.  
Reduce vapour with fog or fine water spray.
- Clean up methods** : Ventilate area.  
Hose down area with water.  
Wash contaminated equipment or sites of leaks with copious quantities of water.

### 7 HANDLING AND STORAGE

- Storage** : Keep container below 50°C in a well ventilated place.  
Segregate from flammable gases and other flammable materials in store.
- Handling** : 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.  
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.

### 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

- 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.
- Occupational Exposure Limits** : Fluorine : TLV© -TWA [ppm] : 1  
Fluorine : TLV© -STEL [ppm] : 2  
Fluorine : OEL (UK)-LTEL [ppm] : 1  
Fluorine : OEL (UK)-STEL [ppm] : 1  
Fluorine : VLE - France [ppm] : 1  
Fluorine : MAK - Germany [ppm] : 0.1



# SAFETY DATA SHEET

Page : 3 / 5

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### 9 PHYSICAL AND CHEMICAL PROPERTIES

|                                    |                                                                                                          |
|------------------------------------|----------------------------------------------------------------------------------------------------------|
| Physical state at 20 °C            | : Compressed gas.                                                                                        |
| Colour                             | : Colourless.                                                                                            |
| Odo(u)r                            | : Pungent.                                                                                               |
| Molecular weight                   | : 38                                                                                                     |
| Melting point [°C]                 | : -220                                                                                                   |
| Boiling point [°C]                 | : -188                                                                                                   |
| Critical temperature [°C]          | : -129                                                                                                   |
| Vapour pressure, 20°C              | : Not applicable.                                                                                        |
| Relative density, gas (air=1)      | : 1.3                                                                                                    |
| Relative density, liquid (water=1) | : 1.5                                                                                                    |
| Solubility in water [mg/l]         | : No reliable data available.                                                                            |
| Flammability range [vol% in air]   | : Oxidiser.                                                                                              |
| Auto-ignition temperature [°C]     | : 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.<br>Reacts with water to form corrosive acids.<br>May react violently with alkalis.<br>With water causes rapid corrosion of some metals.<br>May react violently with reducing agents.<br>Violently oxidises organic material. |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 11 TOXICOLOGICAL INFORMATION

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

### 12 ECOLOGICAL INFORMATION

|                                |                                                       |
|--------------------------------|-------------------------------------------------------|
| Ecological effects information | : May cause pH changes in aqueous ecological systems. |
|--------------------------------|-------------------------------------------------------|

### 13 DISPOSAL CONSIDERATIONS

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General | : Avoid discharge to atmosphere.<br>Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor.<br>Toxic and corrosive gases formed during combustion should be scrubbed before discharge to atmosphere.<br>Do not discharge into any place where its accumulation could be dangerous.<br>Contact supplier if guidance is required. |
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# SAFETY DATA SHEET

Page : 4 / 5

Revised edition no : 1

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**Fluorine****AL057**

## 14 TRANSPORT INFORMATION

|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UN No.                        | : 1045                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| H.I. nr                       | : --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| ADR/RID                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| - Proper shipping name        | : FLUORINE, COMPRESSED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| - ADR Class                   | : 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| - ADR/RID Classification code | : 1 TOC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| - Labelling ADR               | : Label 2.3 : Toxic gas.<br>Label 5.1 : Oxidizing substances.<br>Label 8 : Corrosive substance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Other transport information   | : Avoid transport on vehicles where the load space is not separated from the driver's compartment.<br>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.<br>Before transporting product containers :<br>- Ensure that containers are firmly secured.<br>- Ensure cylinder valve is closed and not leaking.<br>- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.<br>- Ensure valve protection device (where provided) is correctly fitted.<br>- Ensure there is adequate ventilation.<br>- Compliance with applicable regulations. |

## 15 REGULATORY INFORMATION

|                   |                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EC Classification | : Index No : 009-001-00-0<br>O; R7<br>T+; R26<br>C; R35                                                                                                                                                                                                                                                                                                         |
| EC Labelling      |                                                                                                                                                                                                                                                                                                                                                                 |
| - Symbol(s)       | : T+ : Very toxic.<br>C : Corrosive.                                                                                                                                                                                                                                                                                                                            |
| - R Phrase(s)     | : R7 : May cause fire.<br>R26 : Very toxic by inhalation.<br>R35 : Causes severe burns.                                                                                                                                                                                                                                                                         |
| - S Phrase(s)     | : S9 : Keep container in a well-ventilated place.<br>S26 : In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.<br>S36/37/39 : Wear suitable protective clothing, gloves and eye/face protection.<br>S45 : In case of accident or if you feel unwell, seek medical advice immediately ( show the label when possible). |

## 16 OTHER INFORMATION

Ensure all national/local regulations are observed.  
Ensure operators understand the toxicity hazard.  
Users of breathing apparatus must be trained.

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.

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.

**Recommended uses and restrictions** : This SDS is for information purposes only and is subject to change without notice. [ Prior to purchase of products, please contact your local AIR LIQUIDE office for a



# SAFETY DATA SHEET

Page : 5 / 5

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### 16 OTHER INFORMATION (continued)

complete SDS (with Manufacturer's name and emergency phone number).]

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