

## Material Safety Data Sheet

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Version 1.5

According to 91/155/EEC

Classified as Hazardous according to the criteria of EU Annex 1 and NOHSC.

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1 - Product and Company Information

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|                   |   |
|-------------------|---|
| Product Name      | HYDROFLUORIC ACID 40 %  |
| Product Number    | 01067   |
| Company           | Sigma-Aldrich Pty. Ltd.<br>12 Anella Avenue<br>Castle Hill NSW 2154 |
| Technical Phone # | +61 2 9841 0555 (1800 800 097)                                      |
| Fax               | +61 2 9841 0500 (1800 800 096)                                      |
| Emergency Phone # | +44 8701906777 (1800 448 465)                                       |

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2 - Composition/Information on Ingredients

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| Product Name   | CAS #     | EC no     | Annex I<br>Index Number |
|--|-----------|-----------|-------------------------|
| HYDROFLUORIC ACID, NOT MORE THAN<br>60% PERCENT STRENGTH | 7664-39-3 | 231-634-8 | 009-003-00-1            |

|                  |  |
|------------------|--|
| Formula          | HF   |
| Molecular Weight | 20.01 AMU  |
| Synonyms         | Acide fluorhydrique (French) * Acido fluoridrico<br>(Italian) * Fluorowodor (Polish) *<br>Fluorwasserstoff (German) * Fluorwasserstof<br>(Dutch) * Hydrofluoride * Hydrogen fluoride<br>(ACGIH:OSHA) * RCRA waste number U134 * Rubigine |

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3 - Hazards Identification

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SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT  
Very toxic by inhalation, in contact with skin and if swallowed.  
Causes severe burns.

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4 - First Aid Measures

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## AFTER INHALATION

If inhaled, remove to fresh air. If not breathing give  
artificial respiration. If breathing is difficult, give oxygen.

## AFTER SKIN CONTACT

In case of skin contact, flush with copious amounts of water for  
at least 15 minutes. Remove contaminated clothing and shoes.  
Call a physician.

## AFTER EYE CONTACT

In case of contact with eyes, flush with copious amounts of  
water for at least 15 minutes. Assure adequate flushing by  
separating the eyelids with fingers. Call a physician.

#### AFTER INGESTION

If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately. Do not induce vomiting.

#### GENERAL INFORMATION

Hydrofluoric (HF) acid burns require immediate and specialized first aid and medical treatment. Symptoms may be delayed up to 24 hours depending on the concentration of HF. After decontamination with water, further damage can occur due to penetration/absorption of the fluoride ion. Treatment should be directed toward binding the fluoride ion as well as the effects of exposure. Skin exposures can be treated with a 2.5% calcium gluconate gel repeated until burning ceases. More serious skin exposures may require subcutaneous calcium gluconate except for digital areas unless the physician is experienced in this technique, due to the potential for tissue injury from increased pressure. Absorption can readily occur through the subungual areas and should be considered when undergoing decontamination. Prevention of absorption of the fluoride ion in cases of ingestion can be obtained by giving milk, chewable calcium carbonate tablets or Milk of Magnesia to conscious victims. Conditions such as hypocalcemia, hypomagnesemia and cardiac arrhythmias should be monitored for, since they can occur after exposure.

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### 5 - Fire Fighting Measures

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#### EXTINGUISHING MEDIA

Suitable: Dry chemical powder.

#### SPECIAL RISKS

Specific Hazard(s): Emits toxic fumes under fire conditions.  
Explosion Hazards: Container explosion may occur under fire conditions.

#### SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

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### 6 - Accidental Release Measures

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PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL  
Evacuate area.

#### PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

#### METHODS FOR CLEANING UP

Cover with dry lime or soda ash, pick up, keep in a closed container, and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

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### 7 - Handling and Storage

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#### HANDLING

Directions for Safe Handling: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

#### STORAGE

Conditions of Storage: Keep tightly closed. Store away from

heat. Store in a cool dry place.  
Unsuitable: Do not store in glass  
Incompatible Materials: Glass

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## 8 - Exposure Controls / Personal Protection

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### ENGINEERING CONTROLS

Use only in a chemical fume hood. Safety shower and eye bath.

### GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

### EXPOSURE LIMITS

| Country | Source | Type  | Value     |
|---------|--------|-------|-----------|
| Poland  |        | NDS   | 0.5 MG/M3 |
| Poland  |        | NDSch | 2 MG/M3   |
| Poland  |        | NDSP  | -         |

### EXPOSURE LIMITS - EUROPEAN UNION

| Source | Type | Value                |
|--------|------|----------------------|
| OEL    | OEL  | 1.5 mg/m3<br>1.8 ppm |

### EXPOSURE LIMITS - DENMARK

| Source | Type | Value              |
|--------|------|--------------------|
| OEL    | TWA  | 1.6 mg/m3<br>2 ppm |

### EXPOSURE LIMITS - GERMANY

| Source   | Type | Value              |
|----------|------|--------------------|
| TRGS 900 | OEL  | 2.5 mg/m3<br>3 ppm |

Remarks: =1=

Remarks: H

### EXPOSURE LIMITS - NORWAY

| Source | Type | Value                |
|--------|------|----------------------|
|        | OEL  | 0.6 mg/m3<br>0.8 ppm |

### EXPOSURE LIMITS - SWEDEN

| Source | Type       | Value              |
|--------|------------|--------------------|
|        | CLV (Ceil) | 1.7 mg/m3<br>2 ppm |

### EXPOSURE LIMITS - SWITZERLAND

| Source | Type | Value                |
|--------|------|----------------------|
| OEL    | OEL  | 1.5 mg/m3<br>1.8 ppm |

Remarks: M

### EXPOSURE LIMITS - UNITED KINGDOM

| Source | Type | Value              |
|--------|------|--------------------|
| OEL    | STEL | 2.5 mg/m3<br>3 ppm |

### PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator.  
Hand Protection: Compatible chemical-resistant gloves.  
Eye Protection: Chemical safety goggles.  
Special Protective Measures: Faceshield (8-inch minimum).

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## 9 - Physical and Chemical Properties

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|                       |  |                            |
|-----------------------|--|----------------------------|
| Appearance            | Physical State: Clear liquid<br>Color: Colorless |                            |
| Property              | Value  | At Temperature or Pressure |
| pH                    | N/A  |                            |
| BP/BP Range           | N/A  |                            |
| MP/MP Range           | N/A  |                            |
| Flash Point           | N/A  |                            |
| Flammability          | N/A  |                            |
| Autoignition Temp     | N/A  |                            |
| Oxidizing Properties  | N/A  |                            |
| Explosive Properties  | N/A  |                            |
| Explosion Limits      | N/A  |                            |
| Vapor Pressure        | 25 mmHg  | 20 °C                      |
| SG/Density            | 1.16 g/cm3                                       |                            |
| Partition Coefficient | N/A  |                            |
| Viscosity             | N/A  |                            |
| Vapor Density         | 1.27 g/l   |                            |
| Saturated Vapor Conc. | N/A  |                            |
| Evaporation Rate      | N/A  |                            |
| Bulk Density          | N/A  |                            |
| Decomposition Temp.   | N/A  |                            |
| Solvent Content       | N/A  |                            |
| Water Content         | N/A  |                            |
| Surface Tension       | N/A  |                            |
| Conductivity          | N/A  |                            |
| Miscellaneous Data    | N/A  |                            |
| Solubility            | N/A  |                            |

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## 10 - Stability and Reactivity

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### STABILITY

Stable: Stable.

Conditions to Avoid: Light.

Materials to Avoid: Avoid contact with metals., Alkali metals,  
Strong bases, Glass

### HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Hydrogen fluoride.

### HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

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## 11 - Toxicological Information

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RTECS NUMBER: MW7875000

### ACUTE TOXICITY

LCLO  
Inhalation  
Human  
50 ppm  
30M

LC50  
Inhalation  
Rat

1,276 ppm

1H

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation. Behavioral:Change in motor activity (specific assay). Gastrointestinal:Changes in structure or function of salivary glands.

LC50

Inhalation

Mouse

342 ppm

1H

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Corneal damage. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Other. Lungs, Thorax, or Respiration:Dyspnea.

LC50

Inhalation

Monkey

1,774 ppm

1H

Remarks: Behavioral:Coma. Lungs, Thorax, or Respiration:Cyanosis. Gastrointestinal:Other changes.

LC50

Inhalation

Guinea pig

4,327 ppm

15M

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation. Lungs, Thorax, or Respiration:Respiratory depression. Nutritional and Gross Metabolic:Weight loss or decreased weight gain.

#### IRRITATION DATA

Eyes

Human

50 mg

Remarks: Severe irritation effect

#### SIGNS AND SYMPTOMS OF EXPOSURE

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting.

#### ROUTE OF EXPOSURE

Skin Contact: Causes severe burns.

Skin Absorption: May be fatal if absorbed through skin.

Eye Contact: Material is extremely destructive to the tissue of the eyes. Causes severe burns.

Inhalation: May be fatal if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

Ingestion: May be fatal if swallowed.

#### TARGET ORGAN INFORMATION

Kidneys. Liver. Central nervous system.

#### CHRONIC EXPOSURE - MUTAGEN

Result: Laboratory experiments have shown mutagenic effects.

Rat

1 MG/M3/6H/24D-I

Inhalation

Cytogenetic analysis

#### CHRONIC EXPOSURE - TERATOGEN

Result: Laboratory experiments have shown teratogenic effects.

Species: Rat

Dose: 4980 UG/M3/4H

Route of Application: Inhalation

Exposure Time: (1-22D PREG)

Result: Effects on Embryo or Fetus: Fetal death.

#### CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat

Dose: 470 UG/M3/4H

Route of Application: Inhalation

Exposure Time: (1-22D PREG)

Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Fertility:

Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

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#### 12 - Ecological Information

No data available.

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#### 13 - Disposal Considerations

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#### SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

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#### 14 - Transport Information

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##### RID/ADR

UN#: 1790

Class: 8

PG: II

Proper Shipping Name: Hydrofluoric acid

##### IMDG

UN#: 1790

Class: 8

PG: II

Subrisk: 6.1

Proper Shipping Name: Hydrofluoric acid

Marine Pollutant: No

Severe Marine Pollutant: No

##### IATA

UN#: 1790  
Class: 8  
PG: II  
Subrisk: 6.1  
Proper Shipping Name: Hydrofluoric acid  
Inhalation Packing Group I: No

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## 15 - Regulatory Information

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### CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 009-003-00-1

NOTA: B

INDICATION OF DANGER: T+ C

Very toxic. Corrosive.

R-PHRASES: 26/27/28 35

Very toxic by inhalation, in contact with skin and if swallowed. Causes severe burns.

S-PHRASES: 26 28 36/37/39 45

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

### COUNTRY SPECIFIC INFORMATION

#### Germany

WGK: 2

#### SWITZERLAND

SWISS POISON CLASS: 1

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## 16 - Other Information

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### WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2005 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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