

Material Safety Data Sheet

prepared in cooperation with the technical committee of IFPA, Inorganic Fluorine Producers Association

Issued: 2003-10-20

Replaces earlier MSDS issued:

ALUMINIUM FLUORIDE

1. Identification of the substance and of the company

Product name	ALUMINIUM FLUORIDE		
Chemical name	Aluminium fluoride		
Synonyms	Aluminum fluoride, Aluminium trifluoride, Aluminum trifluoride		
Field of application	Flux, mainly for aluminium smelting		
Chemical formula	AlF ₃		
Manufacturer	Aluf fluor AB		
Address	Postcode	SE - 251 09 Helsingborg	
Country	Sweden		
Tel	+46 42 17 10 20		
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E-mail	aluf fluor@aluf fluor.com		
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Emergencies	+46 8 33 12 31		

2. Composition/information on ingredients

No.	Name of compound	CAS-number	EINECS-number	Content (weight-%)	Marking, R- and S-phrases
1	Aluminium fluoride	7784-18-1	232-051-1	>97%	Not applicable
2	Aluminium oxide	1344-28-1	215-691-6	<2%	Not applicable

3. Hazards identification

The product is not classified as hazardous, but as all dusts it may cause irritation of breathing tracts and eyes.

4. First-aid measures

Inhalation

Remove person to fresh air.

Skin contact

Rinse with plenty of water. Wash exposed area thoroughly with soap and water.

Eye contact

Rinse eyes immediately with plenty of water, keeping the eyelids well open. Seek medical attention.

Ingestion

Dilute immediately by drinking large amounts of water or milk. Seek medical attention.

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5. Fire-fighting measures ☒

The product is not flammable.

Fire extinguishing media

The extinguishing media can be chosen depending on the surrounding fire.

Fire- and explosion hazards

The compound can develop toxic fluoride containing gases when heated above 600 °C during fire.

Special protective equipment during fire

Wear self-contained respiratory protective device. Wear fully protective suit.

6. Accidental release measures ☒

Personal precautions

Avoid dusting. Wear personal protective equipment for dust handling.

Environmental precautions

Collect spillage into suitable, sealed containers.

Methods for cleaning up

Clean up using dry procedures and collect spills in a sealed container.

Disposal must be done according to national legislation.

7. Handling and storage ☒

Handling

Avoid dusting. Make sure that the ventilation is sufficient.

Eating and smoking should be avoided during handling. Apply good hygiene.

Storage

Store in a dry, well-ventilated area and protect product containers from physical damage.

Do not store close to products destined for human or animal consumption.

8. Exposure controls / personal protection ☒

Exposure limit values

TLV = 2,5 mg/m³ (Sweden)

Engineering measures

Provide sufficient ventilation. If this measure is not sufficient to keep the particle concentration below the exposure limit value, it will be necessary to use suitable respiratory protection apparatus.

Respiratory protection

If the conditions of use generate dust, use approved respiratory protection with filter P2, P3 or an air-stream helmet.

Hand protection

Wear protective gloves of textile/leather.

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Eye protection

Never wear contact lenses in the work area since it may absorb product irritating the ocular globe. Safety glasses with full side shields or goggles are recommended.

Skin protection

During normal conditions, wear light protective clothing with long sleeves and safety boots/shoes.

Control parameters

Fluorides in urine:

-before shift 3 mg/g of creatinine – ACGIH

-after shift 10 mg/g of creatinine – ACGIH

9. Physical and chemical properties

Appearance

White powder

Odour

Odourless

Sublimation temperature [°C]

1278 [1]

Bulk density [g/cm³]

0,85

Solubility in water

5,3-9,4 mg/l at 25 °C [2]

Vapour pressure

1,3 hPa (at 1238 °C) [9]

pH (concentrate)

4,5-5,0 in sat. sol. [2]

Flash point [°C]

not applicable

Auto ignition temperature [°C]

not self-igniting

Boiling point [°C]

not applicable

10. Stability and reactivity

Conditions to avoid

The product is stable under normal conditions. Avoid high temperatures (above 600 °C when dry, 300 °C in the presence of water), unless when in professional use.

Materials to avoid

Aluminium fluoride may dissolve slowly in strong sulphuric acid with the liberation of hydrogen fluoride and in strong aqueous alkalis with the formation of aluminate. Aluminium fluoride is slowly attacked by fused alkalis, with formation of fluoride and aluminate.

Hazardous decomposition products

The product may develop toxic hydrogen fluoride gas when heated until decomposition, especially in the presence of water.

11. Toxicological information

Inhalation

Inhalation of aluminium fluoride dust irritates the respiratorial tract. An acute inhalation study in rats have shown that the LC₅₀ (4-hour) for AlF₃ is in excess of 0.530 mg/l in air, the maximum practicable concentration. [10]

Ingestion

Ingestion may cause irritation in stomach or gastro-intestinal system.

LD₅₀ (oral) rat >2000 mg/kg [3]

Eye contact

Dust may irritate the eyes.

The product has been tested for eye irritation. Chemosis, redness and discharge occurred, but 72 hours after termination of exposure no abnormalities were observed. [4]

Skin contact

The product is not an irritant, but may cause skin irritation when wet.

The product has been tested for skin irritation. No skin reactions were observed during the test. [5]

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12. Ecological information ☒

Aquatic toxicity

The compound is not toxic to Zebra fish. [6]

The compound has been tested for growth inhibition on algae, but no EC₅₀ (72 h) value could be determined due to the low solubility of the compound. [7]

The compound is not toxic to Daphnia Magna. [8]

Mobility

The product is almost insoluble in water. See further chapter 9: "Physical and chemical properties".

Persistence and degradability

Due to its low solubility, the product may persist for a long period of time.

Bioaccumulative potential

Fluoride ions may be accumulated in bone substance.

13. Disposal considerations ☒

Disposal of product residues

The remaining product must be disposed according to the local/national legislation.

The product manufacturer can provide advice on disposal.

Disposal of packagings

Disposal of uncleaned packagings must be made according to official/national regulations.

The product manufacturer can provide advice on disposal.

14. Transport information ☒

The product is not classified as dangerous goods and therefore does not need to comply with ADR, RID, IMDG and IATA regulations.

This product should be kept away from foodstuffs and pharmaceuticals.

15. Regulatory information ☒

Classification

No classification is applicable for this product.

R-phrases

No R-phrases applicable

S-phrases

No S-phrases applicable

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16. Other information



Revisions are marked with a cross in the box at each headline.

The neutral salts of hydrofluoric acid do not cause skin- and eye-irritation. The neutral fluorides are only acutely and chronically toxic in high doses. Traces of fluorides are everywhere in the environment. [11]

The consequences of exposure to soluble fluorides on health have been investigated and summarised in numerous publications. Chronic exposure can lead to fluorosis. Symptoms of fluorosis: asymptomatic or non-specific rheumatic symptoms with articular pains and stiffening of the joints. Acute symptoms of exposure to fluoride: dizziness, loss of appetite, vomiting.

Results of cohort study on more than 20 000 workers who had been employed for more than 5 years in an aluminium reduction plant did not confirm an excess pulmonary cancer rate.

None of the studies provided any evidence that an increased level of fluoride in water was associated with an increase in cancer mortality. Geographical variations and time variations in the fluoride content of water supplies provide no evidence of association between fluoride ingestion and mortality from cancer in humans.

In general, the effect of fluorides depends on the mode of entry into the body; of special significance is the solubility: highly soluble compounds have more adverse effects after oral intake than sparingly soluble or insoluble ones.

The product must not be used for applications other than those for which it is sold, without having obtained previous written instructions. The producer takes no responsibility for improper use.

This Material Safety Data Sheet has been prepared in cooperation with the MSDS committee of the Inorganic Fluorine Producers Association, IFPA. The MSDS committee consists of members from the following companies:

Alcoa, USA*
Alufluor, Sweden
Derivados del Fluor, Spain
Fluorsid, Italy
Industrial Quimica de Mexico, Mexico
Outokumpu Norzink AS, Norway

* At present not a member of IFPA.

List of abbreviations

ACGIH - American Conference of Governmental Industrial Hygienists

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ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road

CAS No. - Chemical Abstracts Service Registry Number

EEA - European Economic Agreement

IATA - International Air Transport Association

IFPA - Inorganic Fluorine Producers Association

IMDG - International Maritime Dangerous Goods Code

LD₅₀ - 50% Lethal Dose

MSDS - Material Safety Data Sheet

OECD - Organisation for Economic Cooperation and Development

RID - Règlement Concernant le Transport International Ferroviaire des Marchandises Dangereuses

TLV - Threshold Limit Value

WHO - World Health Organisation

IUCLID - International Uniform Chemical Information Database

LC₅₀ - 50% Lethal Concentration

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