

DERIVADOS DEL FLUOR	SAFETY RULES	FDS-40-I
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FLUOROSILICIC ACID 20 - 42%

1. IDENTIFICATION OF THE SUBSTANCE AND THE COMPANY OR ENTERPRISE

1.1. Product identifier

Name of product: Fluorosilicic Acid 20-42%

EC No.: 241-034-8

CAS No.: 16961-83-4

Registration No.: 01-2119488906-19-0004

Other names of product:

- Hexafluorosilicic Acid
- Hydrogen Hexafluorosilicate
- Hydrosilicofluorhydric acid
- Fluosilicic Acid

1.2. Identified appropriate uses of the substance and uses advised against

- Formulation, preparation and packaging of product
- Synthesis of chemicals and intermediates such as petroleum products.
- Use as a process aid as pH regulator, neutralizer, precipitator, flocculant.
- Cleaner and disinfectant.
- Fluoridation in water treatment.
- Metal surface treatment.
- Manufacture of basic metals (electroplating).
- Minerals acidification.
- Laboratory use.

No data available of applications advised against.

1.3. Data of safety data sheet provider

Name of the company: DERIVADOS DEL FLÚOR, S.A.U.

Address: ONTÓN – CASTRO URDIALES

39706 – ONTÓN / CANTABRIA (ESPAÑA)

Tel: +34 942 87 99 00; Fax: **+34 942 87 92 46**

E-mail: ddf@ddfduor.com

1.4. Emergency telephone

DERIVADOS DEL FLÚOR, S.A.U. (Telephone 24 h):
+34 942 87 99 00

Telephone of National Institute of Toxicology:
+34 91-562 04 20

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance according to Royal Decree 363 / 1995 (Directive 67/548/ EEC)

Regulation 1272/2008: Corrosive Substance 1B

Directive 67/548/EEC: Corrosive

2.2. Label elements

Pictogram GHS05



Warding word: Danger

H Phrases: H314

P Phrases: P260, P301+P330+P331, P405, P303+P361+P353, P304+P340, P305+P351+P338

Intense exothermic reaction with alkalis.

Physicochemical hazards

Toxic and corrosive fumes are given off by heating the acid.

It reacts with steel, nickel, aluminium and many other metals, producing flammable hydrogen gas.

Formation of hydrofluoric acid with concentrated acids.

Environmental hazards

Toxic effect to fish and plankton, and also to fixed organisms due to a pH variation.

Hazards to human health

Toxic by inhalation, by ingestion and via contact with the skin. It causes severe burns.

Absorption of fluoride ions into the blood due to inhalation of dust or fumes, ingestion or through the skin can reduce serum calcium levels, leading possibly to hypocalcaemia, and magnesium levels, leading possibly to hypomagnesia, and can inhibit vital enzymes. It can

<u>PREPARED</u>	<u>REVIEWED</u>	<u>APPROVED</u>
E. AÑÓN	O. PÉREZ	E. AÑÓN

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also cause acute, hazardous disturbances of the metabolism and of renal and hepatic functions.

In prolonged, repeated exposure, absorption of fluoride ions into the blood can cause fluorosis (replacement of bone calcium by fluorides).

Symptoms of over-exposure to fluorides include salivation, nausea, vomiting, abdominal pain, diarrhoea, fever and laboured breathing.

Symptoms of severe poisoning include laboured breathing, lung congestion, muscle spasms, convulsions and collapse.

2.3. Other hazards

It is not considered a PBT or mPmB substance.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance

Chemical family: Inorganic Fluoride.

Chemical Name: Fluorosilicic Acid. H_2SiF_6 .

EC No.: 241-034-8

CAS No.: 16961-83-4

4. FIRST AID MEASURES

4.1. Description of first aid measures

Contact with the skin:

Direct contact of the liquid with the skin causes immediate burns, which become more intense over time. Depending on contact time and the speed in applying treatment, they may develop into erythema and vesicles or even burns with necrosis and ulcerations.

Dilute solutions can also cause burns that are hardly noticeable at first.

Fluoride ions penetrate skin and tissue rapidly, causing necrosis of the soft tissue and decalcification of the bones. Unlike other acids, which are quickly neutralised, this process can continue for days.

Immediately remove soiled or splashed clothing, wash the affected area immediately with abundant water for at least 5 minutes, then massage 2.5% calcium gluconate gel into the area until 15 minutes after the pain has disappeared. If necessary, apply a bandage or dressing soaked in 10% calcium gluconate solution.

If calcium gluconate is not available, wash with water for at least 15 minutes.

For skin burns larger than the surface of the hand (approx. 150 cm²) administer 6 effervescent calcium tablets orally (400 mg. of calcium per tablet), dissolved in water. Repeat this dose every 2 hours until arrival at hospital.

For extensive burns, place the victim in a bath of 1-5% calcium gluconate solution.

Seek medical treatment the soonest possible.

Contact with eyes

It is lachrymal and produces painful burns that can cause permanent impairment of vision or even blindness.

Wash eyes immediately with abundant water, keeping lids open, for 10-15 minutes. Then irrigate with normal isotonic saline solution for 15 minutes.

Visit an ophthalmologist immediately.

Inhalation

Causes burns in respiratory tract. It can cause inflammation of the upper respiratory tract, congestion of the lungs, pulmonary oedema, fever and cyanosis, which may not appear until 12-24 hours after exposure. It can be fatal.

Prolonged, repeated exposure to low concentrations of gas can cause nasal congestion, nosebleeds and bronchitis.

Move the victim out of the danger area, make them as comfortable as possible and protect them against the cold. Administer calcium tablets as in cases of skin contact. If breathing is laboured, administer oxygen via a facemask.

Seek medical treatment the soonest possible.

Ingestion

It causes necrosis of the mouth, oesophagus and stomach. It can also cause nausea, vomiting, diarrhoea and circulatory collapse. Administer 6 effervescent tablets by mouth, dissolved in water. If calcium is not available administer milk. Do not induce vomiting.

Seek medical treatment the soonest possible.

4.2. Major symptoms and effects, acute and delayed

The immediacy of treatment is essential to reduce the severity of the consequences of burns or poison.

In either case it is always recommended the council / health care.

4.3. Indication of any medical attention and special treatments that should be dispensed immediately

We strongly recommend the presence of emergency showers and eyewash in the vicinity of jobs.

Due to the unusual nature of the burns and poisoning caused by fluorides, hospital accident and emergency

departments must be perfectly informed of the specific and concrete medical treatment required.

5. FIREFIGHTING MEASURES

The product is not combustible or comburent.

5.1. Extinguishing media

No restriction in case of fire in the vicinity.

5.2. Specific hazards arising from the substance

In the case of heat action due to fire in the vicinity, there is danger of bursting. Move the containers to a safe area, provided that this operation can be made safely. Spray water to cool the containers exposed to fire.

Above 110° C, release of toxic and corrosive gases of Hydrofluoric Acid and Silicium Tetrafluoride.

5.3. Recommendations for fire fighting personnel

During extinguishing work, it is necessary to provide respiratory protection and full chemical protective clothing.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Staff to deal with combat spills should be properly equipped (see section 8). Restrict access to area until totally clean to the people who do not use personal protective equipment. Prevent entry of product into basements.

6.3. Methods and materials for containment and clean-up

If possible, turn leaking-container so that gas escapes better than liquid. Contain the leak with sand, earth or absorbent material. Dilute with water. Dragging with water jet gases / vaporise from escaping. Neutralize with lime. Do not empty into drains.

6.4. Reference to other sections

See sections 8 and 13.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Ensure good ventilation. Emptying, transferring, diluting and dissoluting the product should be made according to a rigorous process, so as to avoid local heating, splashing of liquid and emission of fumes (self-priming pump with closed circuit, self-priming siphon).

If this is not possible, use a pouring device that does not cause splashes. Do not allow partly-used containers to accumulate: seal partly used containers after use and return them to the stores. Empty containers contain waste and must be handled as if full.

7.2. Conditions for safe storage, including possible incompatibilities

Keep the containers hermetically sealed in a cool, well ventilated place, protected from physical damage and heat, and separate from flammable materials. Store full, partly-full and empty containers upright.

Containers should be inspected regularly for early detection of damage or leakage.

Stores should be well away from busy working areas. They should also have two exit doors, as far apart as possible and personal protection equipments should be kept outside, by the exit doors.

In Spain, storage must meet the R. D. 379/2001 (Regulations for the Storage of Chemicals) if stored above 400 l.

Steel tanks lined inside with plastic or suitable rubber may be used for packing, as may PP or PEHD plastic, at atmospheric pressure and with fume treatment systems, PEHD containers or steel containers lined inside with PEHD.

7.3. Specific end-uses

See section 1.2.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

8.1. Control parameters

Limit level for repeated exposures:

VLA – ED: 2.5 mg. (F) / m3 – INSHT Guide.

Biological limit level – VLB

Biological indicator: fluorides in urine.

End of working day: 8 mg /l. – INSHT Guide.

Before shift: 4 mg /g. creatinine; after shift: 7 mg /g. creatinine – BAT.

DNEL: Derived no effect level

Patrón de exposición	Ruta	Valor	Efectos	Población
Efectos agudos locales	Inhalación	3,125 mg/m ³	Irritación (tracto respiratorio) Y corrosividad	Trabajadores
Efectos a largo plazo (locales)	Inhalación	1,88 mg/m ³	Irritación (tracto respiratorio) Y corrosividad	Trabajadores

PNEC: Predicted No Effect Concentration

	Valor
Agua dulce	0,9 mg/l
Agua salada	0,9 mg/l
Suelos	11 mg/l

8.2. Controls of exposure

Local exhaust ventilation is recommended to keep fume emissions to the lowest admissible exposure levels. Splash guards are also advisable at those points where the product is used.

Appropriate technical controls

For handling the product, it should be mandatory the use of personal protective equipment.

Do not eat, drink or smoke while using the product. Before breaks, wash your hands. On finishing work, shower or wash. Change working clothes after handling the product. Change out of soiled or splashed clothing and wash it before re-use. Shower and washroom areas must be separate from changing rooms. Keep the product well away from food, condiments and beverages.

Individual protection measures, such as personal protective equipment

a) Protection of eyes / face

Chemical protective well-fitted goggles, type motorist or diver, plastic glass (e.g. clear PVC) or face visor. It is generally agreed that contact lenses should not be worn when working with chemicals, as they may contribute to the severity of potential damage to the eye.

b) Skin protection

In normal conditions, an apron of suitable material (e.g. Viton or Neoprene), normal protective clothing (overall) with long sleeves and chemical protective boots (e.g. Viton or Neoprene). Additionally, when contact with the product is a possibility, EPI class 3 type 3 (leak-tight to liquids) made of suitable material (Composite, Viton, PVC) must be worn, and for emergencies an EPI class 3 type 1 (leak-tight to gases) of the same material, with self-breathing apparatus must be worn.

Hand protection

Chemical protective gauntlets made of a suitable material (e.g. Viton, Neoprene, PVC)

c) Respiratory protection

If engineering checks, working practices and controls by the authorities are not effective in reducing

concentrations to below legal limits of exposure, wear respiratory protection.

Suitable respiratory equipments, all of them EPI class 3, may be, depending on the fume levels, a face mask with replaceable filters type E1 – E2, hood with suitable plastic visor and replaceable filters of the same type, or isolated equipment either self-contained or with an air line.

Environmental exposure controls

In Spain:

R.D. 547/1979 – Gas emission – total Fluor 40 mg. / Nm3.

R.D. 833/1975 – Gas immission (out of the manufacturing site) / Fluorides 60 µg / m3 (30´)

- Fluorides 20 µg / m3 (1 day)

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on physical and chemical properties

a) Appearance: Clear and colourless liquid

b) Odour: Pungent

) Odorous threshold: No data available

d) pH: 1 (highly acid)

e) Melting point / freezing point: Freezing point according to concentrations of 10%, 25% and 60-70% are -16,6° C, -15,5° C and 19° C respectively.

f) Boiling point and boiling-point range: No data available.

g) Flash point: Not flammable.

h) Evaporation rate: No data available.-

i) Flammability: No data available.

j) Explosiveness: Non-explosive.

k) Vapour pressure: 2.30 kPa at 10% and 30 hPa at 35% and 20° C.

l) Vapour density: No data available.

m) Specific gravity: 1.2235 g/cm³ at 25% and 1.2742 g/cm³ al 30% and 17.5° C. 1.4634 g/cm³ at 60.97% and 25° C

n) Solubilities:

Solubility in water: Miscible in all ratios

Solubility in other chemicals: No data available.

o) N-Octanol/Water partition coefficient. No data available.

p) Self-flammability temperature: Not flammable.

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- q) Decomposition temperature: No data available
r) Viscosity: 11 cp at 10% and 6.5 cp at 23% and 20° C.
s) Explosive properties: Non-explosive
t) Comburent properties: Not comburent

9.2. Additional information

Miscibility: Miscible in water
Liposolubility: No data available
Conductivity: No data available

10. STABILITY AND REACTIVITY

10.1. Reactivity

Reacts intensely with alkalis. Formation of hydrofluoric acid with concentrated acids.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hydrofluoric Acid (HF) and Silicium Tetrafluoride (SiF₄)

10.4. Conditions to avoid

The heating. By heating it to boiling point, starts decomposing.

10.5. Incompatible Materials

The contact with the steel, and other metals, give off flammable hydrogen gas. Attacks the silica, silicates and in particular glass, cement, natural rubber, leather.

10.6. Products of hazardous decomposition

Hydrofluoric Acid (HF) and Silicium Tetrafluoride (SiF₄)

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

a) Acute toxicity

No recorded experimental data. Oral and dermal toxicity as well as by inhalation, tend to be masked by local effects (contact point) due to the corrosivity of the substance.

b) Skin corrosion or irritation

Corrosive acid in contact with the skin.

c) Serious eye injury or irritation

Corrosive acid in contact with the eyes.

d) Respiratory or skin sensitization

Not regarded as sensitizing.

e) Mutagenicity in germinal cells

Not considered mutagenic.

f) Carcinogenicity

Not considered carcinogenic

g) Toxicity for reproduction

In view of the available data, the criteria for classification are not met.

h) Specific toxicity in certain organs (STOT) – single exposure

In view of the available data, the criteria for classification are not met.

i) Specific toxicity in certain organs (STOT) – repeated exposure

In view of the available data, the criteria for classification are not met.

j) Inhalation hazard

Corrosive acid by inhalation.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxic effect on fish and plankton, and also on fixed organisms because of a pH variation.

The product has the potential for bioaccumulation in aquatic organisms

LC50 – freshwater fish: 50 mg./l./96h.

EC10/LC10 or NOEC for freshwater fish = 4 mg/l.

EC10/LC10 or NOEC for freshwater invertebrates: 8.9 mg/l.

12.2. Persistence and degradability

No experimental data available.

12.3. Potential for bioaccumulation

Fluoride ion accumulates in aquatic organisms, predominantly in the exoskeleton of crustaceans and fishes. Not reported accumulation in tissues.

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12.4. Mobility in soil

The product has low mobility in the terrain. The natural alkalinity of soil will slowly dissipate the acidity. If pH>6.5 the ground will strongly bind fluorides. High calcium content will immobilize fluorides also. Prevent contamination of surface water, wastewater and in the field.

12.5. Results of the PBT and mPmB rating

Not considered a PBT or mPmB substance.

12.6. Other adverse effects

No experimental data available.

13. DISPOSAL CONSIDERATIONS

13.1. Methods for waste treatment

Use as much product as possible in the production cycle.

Residual solutions of Fluorosilicic Acid should be adequately treated before being evacuated. Residual solutions should be neutralized with an alkali, being recommended lime better than sodium hydroxide solution. When using carefully these alkalis or their diluted solutions, an excessive heat generation is avoided.

Treatment of packaging

Use as much of the product as possible in the production cycle.

Wash away minor quantities of acid and neutralise with an alkali. Ensure that the container is completely neutralised before treating it as inert or recyclable material.

Other information

Before any disposal procedure, take advice of the local, national and autonomic regulations. In Spain the acts 11/97 -Packaging and Waste of Packing- and 10/98 – Waste Management Act-, are compulsory.

A waste manager or the product manufacturer could provide help or advice on disposal.

14. INFORMATION ON TRANSPORT

14.1. UN number

UN 1778

14.2. Shipping official designation of the United Nations

Fluorosilicic Acid.

14.3. Hazard Class(es) for transport

Road: ADR – Class 8 C1

Rail: RID - Class 8 C1

Sea - IMDG – Class 8

Air - ICAO – Class 8

Hazard Id. Number: 80

Hazard Id. Label: 8

14.4. Packaging group

Group II

14.5. Environmental hazards

Not considered hazardous for the environment.

14.6. Special precautions for users

Keep away from alimentary and pharmaceutical products.

14.7. Bulk transport in accordance with Annex II of MARPOL 73/78 Agreement, and the IBC Code

Not transported in bulk.

15. REGULATORY INFORMATION

Not included in Regulation (EC) 689/2008 on the export and import of dangerous chemicals.

15.1. Regulations and safety legislation, health and environment specific to the substance or mixture

In Spain it is compulsory the R.D. 374/2001 on the protection of health and safety of workers from risks related to chemical agents at work.

It is not included in SEVESO category.

15.2. Chemical safety assessment

We have available the safety assessment for each of the uses described in paragraph 1.2.

16. OTHER INFORMATION

Hazard indications. H PHRASES

H314: Causes severe skin burns and eye damage.

Prevention advises. P PHRASES

P260: Do not breathe dust / fume / gas / mist / vapours / spray.

P301+P330+P331: IF SWALLOWED: rinse mouth. DO NOT induce vomiting.

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P303+P361+P353: IF ON SKIN (or hair): Remove/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.

P405: Store locked up.

The changes in this safety data sheet with respect to the previous revision are indicated in bold.

Any chemical product may be handled in safe conditions if its physicochemical and toxicological properties are known, and technical methods and appropriate organising measures are used, as well as adequate personal protective equipment.

The information provided in this safety data sheet is based on our current knowledge. However, the data provided and the recommendations made do not imply warranty. It is the responsibility of the user to determine the conditions for safe use of this product.

This safety data sheet has been prepared on the basis of Regulation 453/2010 of the Commission on May 20, 2010 for the preparation of Safety Data Sheets for amending Regulation (EC) No 1907/2006 of the European Parliament and Council concerning the Registration, Evaluation, Authorization and Restriction of chemical substances and preparations (REACH).

Date of review: **September 2013**