

SODIUM SILICOFLUORIDE (SODIUM FLUOROSILICATE)

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SECTION 1: IDENTIFICATION

1.1 GHS Product identifier:

SODIUM SILICOFLUORIDE

Synonyms: Sodium fluorosilicate; Sodium hexafluorosilicate; Disodium hexafluorosilicate; Na&sub2;SiF&sub6;

CAS: 16893-85-9

Other means of identification:

Not relevant

1.2 Recommended use of the chemical and restrictions on use:

Relevant uses: Fluoridating agent for potable water treatment; opacifier in opal glass, vitreous enamels and ceramic glazes; wood preservative; laundry sour (textile processing); intermediate in the manufacture of other fluoride chemicals. For industrial user only.

Uses advised against: All uses not specified in this section or in section 7.3.

1.3 Supplier's details:

SURAJ CHEMICALS

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SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture:

GHS:

Classification of this product has been carried out in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), using standard published fluoride-compound classification data.

Acute Tox. 3	Acute oral toxicity, Category 3, H301
Skin Irrit. 2	Skin irritation, Category 2, H315
Eye Irrit. 2	Eye irritation, Category 2, H319
STOT SE 3	Respiratory tract irritation, single exposure, Category 3, H335
Aquatic Acute 1	Hazardous to the aquatic environment, acute hazard, Category 1, H400

2.2 GHS label elements, including precautionary statements:

GHS: Danger

Hazard statements:

H301 – Toxic if swallowed.

H315 – Causes skin irritation.

H319 – Causes serious eye irritation.

H335 – May cause respiratory irritation.

H400 – Very toxic to aquatic life.

Precautionary statements:

P264: Wash exposed skin thoroughly after handling.

P270: Do not eat, drink or smoke when using this product.

P271: Use only outdoors or in a well-ventilated area.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P301+P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor.

P302+P352: IF ON SKIN: Wash with plenty of water.

P304+P340: IF INHALED: Remove person to fresh air and keep 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.

P330: Rinse mouth.

P391: Collect spillage.

P501: Dispose of contents/container in accordance with local regulations.

2.3 Other hazards which do not result in classification:

Liberates hydrogen fluoride/silicon tetrafluoride fumes on contact with strong acids or on strong heating. Not a PBT or vPvB substance.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances:

Chemical description: Sodium Silicofluoride (Sodium Fluorosilicate)

In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
CAS: 16893-85-9	Sodium Silicofluoride — Acute Tox. 3: H301; Skin Irrit. 2: H315; Eye Irrit. 2: H319; STOT SE 3: H335; Aquatic Acute 1: H400 – Danger	≥ 98% (technical grade)

To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

3.2 Mixtures:

Non-applicable

SECTION 4: FIRST AID MEASURES

4.1 Description of necessary first-aid measures:

Request medical assistance immediately, showing the SDS of this product.

By inhalation:

Remove the affected person to fresh air and keep at rest. If breathing is difficult, give oxygen. Seek immediate medical attention.

By skin contact:

Remove contaminated clothing. Wash affected skin thoroughly with plenty of water and soap. Seek medical attention if irritation persists or if contact is prolonged/with concentrated material (fluoride burns can be delayed/deep).

By eye contact:

Rinse immediately with plenty of water for at least 15 minutes, holding eyelids open. Remove contact lenses if present and easy to do. Seek immediate medical/ophthalmological attention.

By ingestion/aspiration:

Rinse mouth with water. Do NOT induce vomiting. Seek immediate medical attention – fluoride ingestion is a medical emergency; have the SDS available for the treating physician (consider calcium gluconate therapy under medical supervision).

4.2 Most important symptoms/effects, acute and delayed:

Ingestion may cause nausea, vomiting, abdominal pain, and – in significant overdose – systemic fluoride toxicity including hypocalcaemia, cardiac arrhythmia and CNS effects. Effects may be delayed; medical observation is advised after significant exposure.

4.3 Indication of immediate medical attention and special treatment needed, if necessary:

Treat as fluoride poisoning. Monitor serum calcium/ECG in cases of significant ingestion; specific medical management (e.g. calcium salts) should be directed by a physician/poison centre.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Suitable extinguishing media:

Suitable: Non-combustible; use extinguishing media appropriate to the surrounding fire (water spray, foam, dry chemical powder, carbon dioxide).

Unsuitable: None known.

5.2 Specific hazards arising from the chemical:

Not combustible, not explosive. On strong heating or contact with acids, decomposes to release toxic and corrosive hydrogen fluoride and silicon tetrafluoride fumes.

5.3 Special protective actions for fire-fighters:

Wear self-contained breathing apparatus and full protective clothing due to the risk of toxic fluoride fumes. Approach from upwind.

Additional provisions:

Contain fire-fighting runoff; avoid discharge to drains/watercourses.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel:

Evacuate unnecessary personnel. Keep upwind. Ventilate the area. Use the personal protective equipment described in Section 8. Avoid contact with skin, eyes and clothing. Avoid generating and inhaling dust.

For emergency responders:

Wear suitable protective equipment as described in Section 8. Act only if trained and equipped for the task.

6.2 Environmental precautions:

Very toxic to aquatic life. Prevent entry into drains, watercourses and soil. Contain and notify the relevant authority in case of release to the environment.

6.3 Methods and materials for containment and cleaning up:

Sweep up (avoid dust generation; dampen if necessary) and place in a suitable, labelled, dry container for reuse (preferred) or disposal. Do not allow contact with acids during clean-up.

6.4 Reference to other sections:

See sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling:

A. General precautions for safe use:

Avoid generating and inhaling dust. Use local exhaust ventilation/dust extraction. Avoid contact with skin and eyes. Keep away from acids (liberates toxic/corrosive HF fumes).

B. Technical recommendations for the prevention of fires and explosions:

Not applicable – product is non-combustible and does not present fire or explosion hazards under normal conditions.

C. Technical recommendations on general occupational hygiene:

Do not eat, drink or smoke during handling; wash hands and exposed skin thoroughly after handling and before breaks/meals.

D. Technical recommendations to prevent environmental risks:

Avoid uncontrolled discharge to the environment, given the aquatic toxicity classification. Follow the protective measures in Section 8.

7.2 Conditions for safe storage, including any incompatibilities:

A. Specific storage requirements:

Storage temperature	Ambient
Maximum shelf life	Typical value — refer to current specification sheet

B. General conditions for storage:

Store in a cool, dry, well-ventilated place in tightly closed containers, segregated from acids and food/feed materials. Keep locked up/restrict access given the toxic classification.

7.3 Specific end use(s):

Except for the instructions already specified, it is not necessary to provide any special recommendation regarding the uses of this product.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters:

Substances whose occupational exposure limits have to be assessed in the workplace, per the Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987):

Identification	Occupational Exposure Limit Type	Value
Sodium Silicofluoride (as fluoride) CAS: 16893-85-9	Time Weighted Average concentration (8 hrs)	2.5 mg/m³ (as F)
	Short-term exposure limit	Not established for this grade

8.2 Appropriate engineering controls:

Ensure adequate general and/or local exhaust ventilation to keep exposure below the occupational exposure limits (where established) and to keep dust concentrations as low as reasonably practicable. Eyewash station and safety shower should be available in the work area. Consult the manufacturer's information leaflet for storage, use, cleaning and maintenance of PPE.

B. Respiratory protection:

Use a particulate (dust) respirator where exposure limits may be exceeded; for higher exposure use an air-purifying respirator with appropriate acid-gas cartridge, given the potential for HF fume formation.

C. Specific protection for the hands:

Chemical-resistant gloves (e.g. nitrile or PVC). Replace at any sign of degradation.

D. Eye and face protection:

Chemical safety goggles mandatory, given the eye irritation hazard and toxicity.

E. Bodily protection:

Protective coveralls and dust-resistant clothing for prolonged or bulk handling. Safety footwear.

F. Additional emergency measures:
Emergency shower (ANSI Z358-1, ISO 3864-1:2011, ISO 3864-4:2011) and eyewash stations (DIN 12 899, ISO 3864-1:2011, ISO 3864-4:2011) should be available in the immediate work area.

Environmental exposure controls:
Avoid release of the product to drains, soil and watercourses. See subsection 7.1.D and Section 12.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Appearance	
Physical state at 20°C	Solid (crystalline powder)
Appearance	White crystalline powder
Odor	Odourless
Odour threshold	Not relevant (odourless)
Volatility	
Boiling point at atmospheric pressure	Not applicable (decomposes before boiling)
Vapour pressure at 20°C	Negligible
Evaporation rate at 20°C	Not relevant (solid)
Product Description	
Density / Relative density at 20°C	2.68 g/cm³
Bulk density	Typical value — refer to current specification sheet
pH (aqueous suspension, 1% w/v)	≈ 3.0 – 4.0 (slightly acidic)
Partition coefficient n-octanol/water	Not applicable (inorganic salt)
Solubility in water at 20°C	Slightly soluble (≈ 0.65 g/100 mL at 25°C)
Decomposition temperature	≈ 400°C (decomposes, releasing SiF&sub4;)
Melting point/freezing point	Decomposes rather than melting (> 400°C)
Flammability	
Flash Point	Non-applicable (inorganic solid)
Flammability (solid, gas)	Non-flammable
Autoignition temperature	Non-applicable
Lower / Upper flammability limit	Non-applicable
Particle Characteristics	
Median equivalent diameter	Typical value — refer to current specification sheet

Molecular weight: 188.06 g/mol. Values are typical literature/specification values for this well-characterised commercial grade; minor batch-to-batch variation is normal.

9.2 Other information:

Explosive properties	Not explosive
Oxidising properties	Not oxidising
Corrosive to metals	Not corrosive in dry form; aqueous suspension mildly acidic and may slowly attack some metals/glass
Heat of combustion	Not relevant (non-combustible)
Surface tension at 20°C	Not relevant (solid)
Refraction index	Not relevant

SECTION 10: STABILITY AND REACTIVITY

- 10.1 Reactivity:**
Reacts with strong acids to liberate toxic and corrosive hydrogen fluoride (HF) and silicon tetrafluoride (SiF&sub4;) gases. Stable under normal dry storage conditions.
- 10.2 Chemical stability:**
Chemically stable under the indicated conditions of storage, handling and use when kept dry and away from acids.
- 10.3 Possibility of hazardous reactions:**
Hazardous fluoride-gas evolution on contact with strong acids. Under normal use conditions, no other hazardous reactions are expected.

10.4 Conditions to avoid:

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	No specific hazard	Avoid strong heating (decomposition fumes)	No specific hazard	Avoid prolonged dampness

10.5 Incompatible materials:

Strong Acids	Strong Alkalis	Moisture
Avoid contact (liberates HF/SiF&sub4; gas)	Avoid contact	Avoid prolonged exposure

- 10.6 Hazardous decomposition products:**
On strong heating or acid contact: hydrogen fluoride (HF) and silicon tetrafluoride (SiF&sub4;), both toxic and corrosive gases.

SECTION 11: TOXICOLOGICAL INFORMATION

- 11.1 Information on toxicological effects:**
As a fluoride compound, sodium silicofluoride presents acute oral toxicity. In case of exposure that is repetitive, prolonged, or at concentrations higher than the recommended occupational exposure limits, adverse health effects may result depending on the means of exposure:
- A. Ingestion (acute effect):**
Toxic if swallowed (H301). May cause nausea, vomiting, abdominal pain and, in significant overdose, systemic fluoride toxicity (hypocalcaemia, cardiac and CNS effects).
- B. Inhalation (acute effect):**
Dust may cause respiratory irritation (H335); significant inhalation exposure may lead to systemic fluoride absorption.
- C. Contact with skin and eyes (acute effect):**
Causes skin irritation (H315). Causes serious eye irritation (H319).

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity):
Classification criteria for carcinogenicity, mutagenicity and reproductive toxicity are not met based on available data. Not listed by IARC.

E. Sensitizing effects:
Not classified as a skin or respiratory sensitiser based on available data.

F. Specific target organ toxicity (STOT) – single exposure:
May cause respiratory irritation (H335).

G. Specific target organ toxicity (STOT) – repeated exposure:
Chronic excessive fluoride exposure is associated with skeletal/dental fluorosis; classification criteria for this product are not met based on available data for occupational exposure at recommended limits.

H. Aspiration hazard:
Not relevant (solid).

Product-specific toxicological information:

Identification	Acute Toxicity	Genus
Sodium Silicofluoride CAS: 16893-85-9	LD50 oral: ≈ 125 mg/kg	Rat
	LD50 dermal: Not established for this grade	–

SECTION 12: ECOLOGICAL INFORMATION

Very toxic to aquatic life.

12.1 Toxicity:

Identification	Acute Toxicity	Species	Genus
Sodium Silicofluoride CAS: 16893-85-9	LC50: ≈ 5–10 mg/L (96h)	Non-applicable	Fish
	EC50: Not established for this grade	Non-applicable	Crustacean

12.2 Persistence and degradability:
Inorganic substance; the concept of biodegradability does not apply. Dissociates in water to fluoride and silicate ions.

12.3 Bioaccumulative potential:
Fluoride ion does not significantly bioaccumulate in soft tissue but may accumulate in calcified tissue (bone) of exposed organisms over prolonged periods.

12.4 Mobility in soil:

Koc	Henry	Dry Soil	Moist Soil
Low (ionic)	Not relevant	Low mobility (sparingly soluble)	Low to moderate mobility

12.5 Results of PBT and vPvB assessment:
Non-applicable (inorganic substance; PBT/vPvB criteria apply to organic substances).

12.6 Other adverse effects:
Fluoride is toxic to many aquatic organisms and plants at elevated concentrations; avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Disposal methods:
Do not discharge to drains, soil or watercourses. Dispose of as hazardous waste via a licensed waste contractor, in accordance with local fluoride-waste disposal regulations.
Refer to national and local regulations on waste management. In India, dispose of in accordance with the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, as amended, through an authorised waste handler/recycler, or as advised by the State Pollution Control Board.

SECTION 14: TRANSPORT INFORMATION

Transport of dangerous goods by land (ADR 2023 / RID 2023 principles, as adapted for India):

14.1 UN number	UN2674
14.2 UN proper shipping name	SODIUM FLUOROSILICATE
14.3 Transport hazard class(es)	6.1
14.4 Packing group	III
14.5 Environmental hazard	Yes
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk	Subject to applicable bulk-solid transport provisions

Transport of dangerous goods by sea (IMDG):

14.1 UN number	UN2674
14.2 UN proper shipping name	SODIUM FLUOROSILICATE
14.3 Transport hazard class(es)	6.1
14.4 Packing group	III
14.5 Marine pollutant	Yes
14.6 Special precautions for user	EmS Codes: F-A, S-A
14.7 Transport in bulk	Subject to applicable bulk-solid transport provisions

Transport of dangerous goods by air (IATA/ICAO):

14.1 UN number	UN2674
14.2 UN proper shipping name	SODIUM FLUOROSILICATE
14.3 Transport hazard class(es)	6.1
14.4 Packing group	III
14.5 Environmental hazard	Yes
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk	Not relevant for packaged goods

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations specific for the product in question:

It is recommended to use the information included in this safety data sheet as data used in a risk evaluation of local circumstances, in order to establish the necessary risk prevention measures for the manipulation, use, storage and disposal of this product.

Other legislation (India):

- Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 (as amended)
- The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987)
- The Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996
- Public Liability Insurance Act, 1991
- Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

SECTION 16: OTHER INFORMATION

Legislation related to safety data sheets:

This safety data sheet has been designed in accordance with Annex 4 – Guidance on the preparation of Safety Data Sheets of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Texts of the legislative phrases mentioned in sections 2 and 3:

- H301: Toxic if swallowed.
- H315: Causes skin irritation.
- H319: Causes serious eye irritation.
- H335: May cause respiratory irritation.
- H400: Very toxic to aquatic life.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

Advice related to training:

Minimal training is recommended to prevent industrial risks for staff using this product, in order to facilitate their comprehension and interpretation of this safety data sheet, as well as the label on the product.

Principal bibliographical sources:

United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS); European Chemicals Agency (ECHA) Classification & Labelling Inventory; United Nations Recommendations on the Transport of Dangerous Goods (Model Regulations).

Abbreviations and acronyms:

ADR: European agreement concerning the international carriage of dangerous goods by road | IMDG: International maritime dangerous goods code | IATA: International Air Transport Association | ICAO: International Civil Aviation Organisation | PG: Packing Group | BCF: Bioconcentration factor | LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | Log-Pow: Octanol-water partition coefficient | IARC: International Agency for Research on Cancer | STOT SE/RE: Specific Target Organ Toxicity, Single/Repeated Exposure | PBT/vPvB: Persistent, Bioaccumulative and Toxic / very Persistent, very Bioaccumulative

The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

END OF SAFETY DATA SHEET

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