

## MATERIAL SAFETY DATA SHEET

**PRODUCT NAME : SODIUM FLUORIDE**

### 1. Product and Company Identification

Product name: Sodium Fluoride  
Synonyms: Floridine, Sodium monofluoride, Disodium difluoride, Natrium fluoride, Florocid  
Item Numbers: N/A

#### European Contact Details

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Chemtrec: 1-800-424-9300

### 2. Hazards Identification

#### EMERGENCY OVERVIEW

White to off-white crystalline material that can cause severe eye irritation with burns and skin or respiratory irritation. Skin irritation may be delayed. If inhaled or swallowed, this compound can cause fluoride poisoning. Repeated overexposure to fluorides may have long-term health effects.

For short and long term exposure effects, refer to Section 11 Toxicological data.

**Eye Effects:** Contact may cause severe irritation and burns with lesions and loss of vision.

**Skin Effects:** May cause severe skin irritation. Irritation may be delayed. It is possible that tissue damage may occur if skin is wet or moist. Effects are progressive while any residual active fluorides remain.

**Ingestion/Oral Effects:** May react with stomach acid to produce highly corrosive hydrogen fluoride. Ingestion of sufficient quantities may cause salivation, nausea, vomiting, diarrhoea, and abdominal pain. Symptoms of weakness, tremors, shallow respiration, cardopedal spasm, convulsions, and coma may follow. May cause brain and kidney damage. Fluorides may cause circulatory or respiratory failure and death. Effects may be delayed.

**Inhalation Effects:** May be absorbed through inhalation of dust; symptoms may parallel those from ingestion exposure. May cause severe respiratory irritation accompanied by coughing, burning sensation, and difficulty breathing. Significant amounts may cause fluid retention and swelling in the lungs (oedema). Repeated exposure may cause chronic bronchitis or other long-term health effects (refer to Section 11).

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Extended Effects: Extended low level systemic absorption of fluoride may cause fluorosis, an abnormal calcification pattern of the skeletal system. Prolonged repeated exposure may cause changes in the bone and chronic respiratory irritation, congestion, and impairment.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Irritant properties may aggravate pre-existing eye, skin, and respiratory conditions. Individuals suffering from diabetes or kidney problems may be more susceptible to the effects of fluoride.

NFPA Hazard codes		HMIS Hazard codes		Rating System
Health	3	Health	2	0 = No Hazard
Flammability	0	Flammability	0	1 = Slight Hazard
Instability	0	Reactivity	0	2 = Moderate Hazard
				3 = Serious Hazard
				4 = Severe Hazard

### 3. Composition/Information on Ingredients

Ingredient	% Weight	CAS No	Hazard class*	Risk phrase*	EINECS No
Sodium Fluoride FORMULA: NaF RTECS: WB0350010	100	7681-49-4	T	R25; R32; R36/38	231-667-8

\*Hazard class & Risk phrase. These columns are only completed for ingredients which are classified as hazardous under EU Directive No 1272/2008 (as amended) and are present in sufficient concentration to make the overall substance hazardous. In all other situations, the column will be completed as "Not applicable".

### 4. First Aid Measures

Eyes: Immediately flush eyes with lukewarm water for at least 15 minutes occasionally opening and closing upper and lower lid to ensure adequate flushing. Continue flushing and get immediate medical attention.

Skin: If exposure occurs, remove contaminated clothing as rapidly as possible while flushing affected area with copious quantities of water. Irritation may be delayed but get immediate medical attention. Skin may be treated with a calcium gluconate gel or slurry in water or glycerine to bind the active fluorides in an insoluble form and limit irritation.

Ingestion/Oral: Administer 1-2 glassfuls of milk, calcium gluconate, or calcium lactate to bind fluoride ion in the gastrointestinal tract. Never give anything by mouth to an individual who is, or could rapidly become, unconscious. Get immediate medical attention and show the product label.

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- Inhalation:** Prompt medical attention is mandatory in all cases of over-exposure to dusts. Rescue personnel must be equipped with appropriate respirators.  
Victims should be assisted to an uncontaminated area to inhale fresh air. Quick removal from the contaminated area is most important. Get immediate medical attention and show the product label. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If breathing has stopped, administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive. Make sure that mucous or vomited material does not obstruct the airway by use of positional drainage.
- Other Information:** Delayed pulmonary oedema may occur. Keep patient under medical observation for at least 48 hours.

## 5. Firefighting Measures

- Extinguishing Media:** Sodium fluoride is non-flammable. You must, however, use media appropriate to any surrounding fire, and use water spray in flooding quantities as necessary.
- Fire and Explosion Hazard:** Material will not burn. Can evolve hydrogen fluoride and disodium oxide under fire conditions.
- Instructions and Special Protective Equipment for Firefighters:** Approach fire from upwind. Firefighters should wear respiratory protection (SCBA) and full turnout or Bunker gear with additional chemical protective clothing as necessary to prevent exposure.  
Water from firefighting is corrosive. Prevent runoff to waterways and sewers.

For Flammability Properties - refer to Section 9.

## 6. Accidental Release Measures

Immediately evacuate all personnel from affected area and deny entry to unauthorised or unprotected individuals. Use appropriate protective equipment (refer to Section 8). Do not touch, walk through or otherwise scatter spilled material.

**Small Spill:** Use appropriate tools to put the spilled solid in a convenient waste disposal container.

**Large Spill:** Treat as a poisonous solid. Stop leak if without risk. Do not get water inside container. Use water spray to reduce vapours. Prevent entry into sewers, basements or confined areas; dyke the surrounding area if necessary. Check to make sure that the product is not present at a concentration level above TLV. (For the TLV, refer to Section 8 and confer with local authorities.)

Contact your closest Edwards location for further instructions.

## 7. Handling and Storage

- Handling:** Do not eat, drink, smoke, apply cosmetics or store personal items in work and storage areas. Wear chemical resistant suit, gloves, chemical type goggles, and resistant boots. Wash thoroughly after handling. Use with adequate ventilation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.
- Storage:** Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids.

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### 8. Exposure Controls/Personal Protection

#### Exposure Limits:

Ingredient	ACGIH - TLV	OSHA - PEL	Occupational Exposure Limits EH40 (UK)
Sodium Fluoride	2.5 mg/m <sup>3</sup> (Fluorides, as F)	2.5 mg/m <sup>3</sup> (Fluorides, as F)	2.5 mg/m <sup>3</sup> (TWA)

#### Personal Protection:

##### Engineering Measures:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

##### Respiratory Protection:

If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate authority or respirator supplier, whichever is lowest. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate authority or respirator supplier, whichever is lowest. If oil particles (for example lubricants, cutting fluids, glycerine, and so forth.) are present, use a NIOSH type R or P filter.

For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

##### Hand/Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

##### Eye/Face Protection:

Wear safety glasses. If sodium fluoride is released, wear chemical goggles or respirator depending upon level of exposure.

##### Hygiene Measures:

Wash thoroughly after handling, before meals and breaks and before leaving the work area.

##### Other/General Protection:

A safety shower and eyewash "fountain" should be located in close proximity to the work area.

### 9. Physical and Chemical Properties

Appearance and Odour	Odourless white crystals	Boiling point	3092/1700	°C/°F
pH (as supplied)	7.4 (solution)	Freezing Point	990/1814	°C/°F
Solubility in Water	4.0 g/100 ml @ 15 °C (59 °F)	Auto Ignition	No data	°C/°F
Volatile Content by Volume	0	Flash Point	Not applicable	°C/°F
Specific Gravity	2.78			
Vapour Pressure (mbar)	1.33 @ 1077°C (3092 °F)	Vapour Pressure (Torr)	1 @ 1077°C (3092 °F)	

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### 10. Stability and Reactivity

Stability:	Stable under normal temperature conditions.
Material/Conditions to Avoid:	Oxidizing agents, metals, acids, alkalis.
Hazardous Decomposition:	Contact with metals may evolve flammable hydrogen gas. Sodium reacts with acids to form hydrogen fluoride. Alkali fluorides (except lithium salt) absorb Sodium Fluoride to form acid fluorides. Thermal decomposition will produce toxic hydrogen fluoride and disodium oxide.
Hazardous Polymerisation:	Will not occur.

### 11. Toxicological Information

For a comprehensive description for the various toxicological (health) effects which may arise if the user comes into contact with the substance or preparation, refer to Section 2 (Hazards Identification).

#### Inhalation:

Inhalation may cause irritation and pulmonary oedema. Repeated inhalation may have chronic effects.

#### Ingestion:

See Animal Data.

#### Skin and Eye:

A 2% aqueous solution of sodium fluoride caused corneal defects and necrotic areas in the conjunctiva.

#### Animal data:

LD50 value: Oral LD50s of 32 mg/kg and 51.6 mg/kg (administered under light anaesthesia via stomach tube) have been cited in the rat. Oral LD50s of 57 mg/kg in the mouse and 200 mg/kg in the rabbit have also been reported.

LC50 value: Ninety-six-hour LC<sub>50</sub>s for fluoride in freshwater fish range from 51 mg/litre in the rainbow trout (*Oncorhynchus mykiss*) to 460 mg/litre in the threespine stickleback (*Gasterosteus aculeatus*). All 96-hour acute toxicity tests on marine fish gave results greater than 100 mg/litre.

#### Carcinogenicity:

ACGIH: A4 (Not classifiable for human or animal).

IARC: 3 (Not classifiable for human).

#### Mutagenicity:

Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast.

May cause damage to the following organs: kidneys, lungs, the nervous system, heart, gastrointestinal tract, cardiovascular system, bones, teeth.

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### Special Remarks on Chronic Effects on Humans:

May cause adverse reproductive effects (fertility, fetotoxicity), and birth defects based on animal data. May cause cancer based on animal data. May cause genetic (mutagenic) and tumorigenic effects.

### 12. Ecological Information

Does not contain Class I or Class II ozone depleting substances.

Sodium fluoride is listed as an extremely hazardous substance with a threshold planning quantity (TPQ) of 100 pounds. The CERCLA Reportable Quantity (RQ) is 1000 pounds.

### Environmental Toxicity

48 hour EC50 Daphnia magna (water flea): 338 mg/litre.

96 hour LC50 Lepomis macrochirus (bluegill): > 530 mg/litre.

96 hour EC50 Selenastrum capricornutum (green algae): 272 mg/litre.

LD50, oral (goat, sheep) 100 mg/kg; LD50, oral (wild bird) 110 mg/kg.

This material is not expected to be toxic to aquatic life.

### 13. Disposal Considerations

Do not attempt to dispose or recycle residual waste or unused quantities. Contact Edwards for recycle and/or disposal instructions.

### 14. Transport Information

This product is classified as hazardous under transport regulations.

PARAMETER	EUROPEAN	CANADIAN TDG	UNITED STATES DOT
Proper Shipping Name	Sodium fluoride	Sodium fluoride	Sodium fluoride
Hazard Class	6.1	6.1	6.1
Identification Number	UN 1690	UN 1690	UN 1690
Shipping Label	Toxic 	Toxic 	Poison 

### Additional Marking Requirement:

If net weight of product > 1000 pounds, the container must be also marked with the letters "RQ".

### Additional Shipping Paper Description Requirement:

If net weight of product > 1000 pounds, the shipping papers must be also marked with the letters "RQ".

### Packing Group: III



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### 16. Other Information

This MSDS is compiled in accordance with ANSI Z400.1 and Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Sources of information for this data sheet:

- Mallinckrodt Inc Sodium Fluoride Material Safety Data Sheet, revised 26th November 2007.
- Science Lab Sodium Fluoride Material Safety Data Sheet, revised 11th June 2008.

### Glossary:

ACGIH - American Conference of Governmental Industrial Hygienists; ANSI - American National Standards Institute; Canadian TDG - Canadian Transportation of Dangerous Goods; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation and Liability Act; CFR - Code of Federal Regulations; Chemtrec - Chemical Transportation Emergency Center (US); DSL - Domestic Substances List; EEC - European Economic Community; EH40 (UK) - HSE Guidance Note EH40 Occupational Exposure Limits; EPCRA - Emergency Planning and Community Right-to-Know Act; EU - European Union; HMIS - Hazardous Material Information Service; LC - Lethal Concentration; LD - Lethal Dose; NFPA - National Fire Protection Association; OSHA - Occupational Safety and Health Administration, US Department of Labour; PEL - Permissible Exposure Limit; RQ - Required Quantity; SARA (Title III) - Superfund Amendments and Reauthorization Act; SARA 313 - Superfund Amendments and Reauthorization Act, Section 313; SCBA - Self-Contained Breathing Apparatus; STEL - Short Term Exposure Limit; TLV - Threshold Limit Value; TPO - Threshold Planning Quantity; TSCA - Toxic Substances Control Act Public Law 94-469; TWA - Time-Weighted Average; US DOT - US Department of Transportation; WHMIS - Workplace Hazardous Materials Information System.

### Revisions:

April 2009 - Data Sheet updated to reflect the latest supplier safety information.

June 2010 - Data Sheet updated to reflect current regulatory information.

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