



# SODIUM FLUORIDE

## Material Safety Data Sheet

### 1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	SODIUM FLUORIDE
UN-Number	UN1690
Recommended Use	In removal of HF from exhaust gases to reduce air pollution.
Supplier Address*	<p>Linde Gas North America LLC - Linde Merchant Production Inc. - Linde LLC            575 Mountain Ave.            Murray Hill, NJ 07974            Phone: 908-464-8100            www.lindeus.com</p> <p>Linde Gas Puerto Rico, Inc.            Las Palmas Village            Road No. 869, Street No. 7            Catano, Puerto Rico 00962            Phone: 787-641-7445            www.pr.lindegas.com</p> <p>Linde Canada Limited            5860 Chedworth Way            Mississauga, Ontario L5R 0A2            Phone: 905-501-1700            www.lindecana.com</p> <p>* May include subsidiaries or affiliate companies/divisions.</p> <p>For additional product information contact your local customer service.</p>
Chemical Emergency Phone Number	Chemtrec: 1-800-424-9300 for US/ 703-527-3887 outside US

### 2. HAZARDS IDENTIFICATION

<b>DANGER!</b>		
<b>Emergency Overview</b>		
Toxic if swallowed Toxic in contact with skin Corrosive The product causes burns of eyes, skin and mucous membranes. May impair fertility May cause harm to the unborn child		
Appearance Off-white	Physical State Solid, Powder.	Odor Odorless

#### Potential Health Effects

Principle Routes of Exposure Skin contact. Eye contact. Ingestion. Inhalation.

**Acute Toxicity**

<b>Inhalation</b>	Harmful by inhalation. Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Aspiration into lungs can produce severe lung damage.
<b>Eyes</b>	Causes burns. Corrosive to the eyes and may cause severe damage including blindness.
<b>Skin</b>	Causes burns.
<b>Skin Absorption Hazard</b>	May be harmful in contact with skin.
<b>Ingestion</b>	Harmful if swallowed. Ingestion causes burns of the upper digestive and respiratory tract. Can burn mouth, throat, and stomach.
<b>Chronic Effects</b>	Long-term exposure to fluorides can adversely affect bones (including teeth).
<b>Aggravated Medical Conditions</b>	Pre-existing eye disorders. Skin disorders. Respiratory disorders. Bone.
<b>Environmental Hazard</b>	See Section 12 for additional Ecological Information.

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Chemical Name	CAS-No	Volume %	Chemical Formula
Sodium fluoride	7681-49-4	> 99	NaF

**4. FIRST AID MEASURES**

<b>General Advice</b>	Immediate medical attention is required. If symptoms persist, call a physician.
<b>Eye Contact</b>	Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Call a physician immediately.
<b>Skin Contact</b>	Immediate medical attention is required. Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Remove and wash contaminated clothing before re-use. Dermal burns may be treated with calcium gluconate gel or slurry in water or glycerine. This compound binds the active fluorides in an insoluble form and limits burn extension and pain.
<b>Inhalation</b>	PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF INHALATION OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Conscious inhalation victims should be assisted to an uncontaminated area and inhale fresh air. If breathing is difficult, administer oxygen. Unconscious persons should be moved to an uncontaminated area and, as necessary, given artificial resuscitation and supplemental oxygen. Treatment should be symptomatic and supportive.
<b>Ingestion</b>	Do NOT induce vomiting. Call a physician or Poison Control Center immediately. Never give anything by mouth to an unconscious person. Drink plenty of water. Clean mouth with water and afterwards drink plenty of water. Consult a physician.
<b>Notes to Physician</b>	For dermal exposure, the use of 2.5-33% calcium gluconate or carbonate gel or slurry has been recommended. The gel is either placed into a surgical glove into which the affected extremity is then placed or applied directly on the burn. This compound binds with the active fluorides in an insoluble form and limits burn extension and pain. Calcium chloride should not be used.
<b>Protection of First-aiders</b>	Use personal protective equipment. Avoid contact with skin, eyes and clothing.

## 5. FIRE-FIGHTING MEASURES

Flammable Properties	Not flammable.
Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Hazardous Combustion Products	Hydrogen fluoride. Disodium oxide.
<u>Explosion Data</u>	
Sensitivity to Mechanical Impact	None
Sensitivity to Static Discharge	None
Specific Hazards Arising from the Chemical	The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors. In the event of fire and/or explosion do not breathe fumes. Substance will react with water (some violently), releasing corrosive and/or toxic gases.
Protective Equipment and Precautions for Firefighters	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Additional chemical protective clothing may be required to protect from toxic decomposition products.

## 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Avoid dust formation.
Environmental Precautions	Do not allow material to contaminate ground water system. Should not be released into the environment. Prevent further leakage or spillage if safe to do so. Prevent product from entering drains.
Methods for Containment	Prevent further leakage or spillage if safe to do so. Prevent dust cloud.
Methods for Cleaning Up	Use personal protective equipment. Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry. Take up mechanically and collect in suitable container for disposal. Avoid dust formation. Clean contaminated surface thoroughly.
Other Information	Do not get water inside containers. Refer to protective measures listed in Sections 7 and 8.

## 7. HANDLING AND STORAGE

Handling	Wear personal protective equipment. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Do not breathe vapors/dust. Remove and wash contaminated clothing before re-use.  Handle in accordance with good industrial hygiene and safety practice.
Storage	Keep container tightly closed in a dry and well-ventilated place. Keep in properly labeled containers. Keep out of the reach of children.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Sodium fluoride 7681-49-4	TWA: 2.5 mg/m <sup>3</sup> F	TWA: 2.5 mg/m <sup>3</sup> F (vacated) TWA: 2.5 mg/m <sup>3</sup>	IDLH: 250 mg/m <sup>3</sup> F TWA: 2.5 mg/m <sup>3</sup> F

*Immediately Dangerous to Life or Health. ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value. OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits.*

<b>Other Exposure Guidelines</b>	Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).
<b>Engineering Measures</b>	Showers. Eyewash stations. Ventilation systems.
<b>Ventilation</b>	Use ventilation adequate to keep exposures below recommended exposure limits.
<b><u>Personal Protective Equipment</u></b>	
<b>Eye/Face Protection</b>	Tightly fitting safety goggles. Face-shield.
<b>Skin and Body Protection</b>	Wear protective gloves/clothing.
<b>Respiratory Protection</b>	
<b>General Use</b>	If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.
<b>Emergency Use</b>	Use positive pressure air line respirator or self-contained breathing apparatus for exposure over exposure limits or emergency use. For exposures above IDLH, an additional escape bottle is required.
<b>Hygiene Measures</b>	When using, do not eat, drink or smoke. Provide regular cleaning of equipment, work area and clothing. Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Keep away from food, drink and animal feeding stuffs.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance</b>	Off-white.	<b>Odor</b>	Odorless.
<b>Odor Threshold</b>	No information available.	<b>Physical State</b>	Solid, Powder
<b>Flash Point</b>	No information available.	<b>Autoignition Temperature</b>	No information available.
<b>Decomposition Temperature</b>	No information available.	<b>Boiling Point/Boiling Range</b>	1704°C / 3099.2°F
<b>Freezing Point</b>	993°C / 1819.4°F	<b>Molecular Weight</b>	42
<b>Water Solubility</b>	4.0 g/100 mL @ 15°C, 4.3 g/100 mL @ 20°C, 5.0 g/100mL @ 100°C	<b>Evaporation Rate</b>	No information available
<b>Vapor Pressure</b>	5.58E <sup>-16</sup> mmHg @ 25°C (Approximate)	<b>Vapor Density</b>	1.4
<b>Bulk Density</b>	2.78	<b>VOC Content (%)</b>	Not applicable.
<b>Partition Coefficient: n-octanol/water</b>	~ -0.77	<b>Flammability Limits in Air</b>	
		<b>Upper</b>	Not applicable
		<b>Lower</b>	Not applicable

Note: pH = 7.4 (solution)

## 10. STABILITY AND REACTIVITY

<b>Stability</b>	Stable under recommended storage conditions.
<b>Incompatible Products</b>	Acids.

**Conditions to Avoid** Exposure to air or moisture over prolonged periods. Dust formation.

**Hazardous Decomposition Products** Hydrogen fluoride. Disodium oxide.

**Hazardous Polymerization** Hazardous polymerization does not occur.

## 11. TOXICOLOGICAL INFORMATION

### Acute Toxicity

**LD50 Oral:** 57 mg/kg (mouse) 200 mg/kg (rabbit)

**LD50 Dermal:**  
**LD50 Dermal VALUE** 175 mg/kg (rat)

**LC50 Inhalation:** No information available.

**Eye Contact** Application of an aqueous solution of 2% sodium fluoride to the eyes of rabbits caused corneal epithelial defects and necrosis of the conjunctiva.

**Skin Contact** Cause skin irritation and necrosis in epidermis tissues.

**Repeated Dose Toxicity** No information available.

### Chronic Toxicity

**Chronic Toxicity** Long-term exposure to fluorides can adversely affect bones (including teeth).

**Carcinogenicity** The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Sodium fluoride		Group 3		

**IARC: (International Agency for Research on Cancer)**  
Group 3: Not Classifiable as to its Carcinogenicity to Humans

**Irritation** No information available.

**Sensitization** No information available.

**Mutagenic Effects** Reported to induce recessive lethal mutations in the germ cells of male fruitfly (*Drosophila melanogaster*) and cytogenetic damage in bone marrow or sperm cells.

**Reproductive Toxicity** No information available.

**Developmental Toxicity** No information available.

**Synergistic Materials** None known.

**Target Organ Effects** Central nervous system (CNS). Eyes. Kidney. Respiratory system. Skeletal system. Skin.

## 12. ECOLOGICAL INFORMATION

This product contains a chemical which is listed as a marine pollutant according to DOT.

### Ecotoxicity

May cause long-term adverse effects in the aquatic environment.

Ozone depletion potential; ODP; (R-11 = 1): Does not contain ozone depleting chemical (40 CFR Part 82).

Chemical Name	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
Sodium fluoride	EC50 96 h: = 272 mg/L (Pseudokirchneriella subcapitata) EC50 72 h: = 850 mg/L static (Desmodesmus subspicatus)	LC50 96 h: 38-68 mg/L static (Oncorhynchus mykiss) LC50 96 h: = 180 mg/L semi-static (Pimephales promelas) LC50 96 h: = 830 mg/L semi-static (Lepomis macrochirus) LC50 96 h: > 530 mg/L (Lepomis macrochirus)		EC50 48 h: = 338 mg/L (Daphnia magna) EC50 48 h: = 98 mg/L Static (Daphnia magna)

### 13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods	Do not attempt to dispose of residual waste or unused quantities. Contact Linde for recycle and/or disposal instructions.
Contaminated Packaging	Do not re-use empty containers.

### 14. TRANSPORT INFORMATION

#### DOT

Proper shipping name	Sodium fluoride, solid
Hazard Class	6.1
Subsidiary Class	None
UN-Number	UN1690
Packing Group	III
Marine Pollutant	This product contains a chemical which is listed as a marine pollutant according to DOT.
Description	UN1690,Sodium fluoride, solid,6.1,PG III,Marine Pollutant
<u>TDG</u>	

Proper Shipping Name	Sodium fluoride
Hazard Class	6.1
UN-Number	UN1690
Packing Group	III
Marine Pollutant	This product contains a chemical which is listed as a marine pollutant according to TDG.
Description	UN1690,SODIUM FLUORIDE,6.1,PG III,Marine Pollutant

#### MEX

Proper Shipping Name	Sodium fluoride
Hazard Class	6.1
UN-Number	UN1690
Description	UN1690 Sodium fluoride,6.1,III
Packing Group	III

#### IATA

UN-Number	UN1690
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Proper Shipping Name	Sodium fluoride, solid
Hazard Class	6.1
Packing Group	III
ERG Code	6L
Description	UN1690,Sodium fluoride, solid,6.1,PG III
Maximum Quantity for Passenger	100 kg
Maximum Quantity for Cargo Only	200 kg
Limited Quantity	10 kg

IMDG/IMO

Proper Shipping Name	Sodium fluoride, solid
Hazard Class	6.1
Subsidiary Class	P
UN-Number	UN1690
Packing Group	III
EmS No.	F-A, S-A
Description	UN1690, Sodium fluoride, solid,6.1(P),PG III,Marine Pollutant

ADR

Proper Shipping Name	Sodium fluoride, solid
Hazard Class	6.1
UN-Number	UN1690
Packing Group	III
Classification Code	T5
Description	UN1690 Sodium fluoride, solid,6.1,III

**15. REGULATORY INFORMATION**International Inventories

TSCA	Complies
DSL	Complies
EINECS/ELINCS	Complies

Legend

- TSCA - United States Toxic Substances Control Act Section 8(b) Inventory  
 DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List  
 EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

U.S. Federal RegulationsSARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

**Clean Water Act**

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42):

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sodium fluoride	1000 lb			X

**Risk and Process Safety Management Programs**

This material, as supplied, does not contain any regulated substances with specified thresholds under 40 CFR Part 68.  
This product does not contain any substances regulated as Highly Hazardous Chemicals pursuant to the 29 CFR Part 1910.110.

**Clean Air Act, Section 112 Hazardous Air Pollutants (HAPS) (see 40 CFR 61)**

This product does not contain any substances regulated as hazardous air pollutants (HAPS) under Section 112 of the Clean Air Act Amendments of 1990.

**CERCLA/SARA**

This material, as supplied, contains one or more substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355):

Chemical Name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	TPQ
Sodium fluoride	1000 lb		

**U.S. State Regulations****California Proposition 65**

This product does not contain any Proposition 65 chemicals.

**U.S. State Right-to-Know Regulations**

Chemical Name	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Sodium fluoride	X	X	X		X

**International Regulations****Canada**

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

**WHMIS Hazard Class**

D1B Toxic materials  
D2A Very toxic materials  
D2B Toxic materials



Chemical Name	NPRI
Sodium fluoride	X

**Legend**

NPRI - National Pollutant Release Inventory

**16. OTHER INFORMATION**

Prepared By                      Product Stewardship  
                                          23 British American Blvd.  
                                          Latham, NY 12110  
                                          1-800-572-6501

Issuing Date                      14-Feb-2011

Revision Date

Revision Number                      0

Revision Note                      Initial Release.

<u>NFPA</u>	Health Hazard 3	Flammability 0	Stability 0	Physical and Chemical Hazards -
<u>HMIS</u>	Health Hazard 3*	Flammability 0	Physical Hazard 0	Personal Protection -

**Note:** Ratings were assigned in accordance with Compressed Gas Association (CGA) guidelines as published in CGA Pamphlet P-19-2009, CGA Recommended Hazard Ratings for Compressed Gases, 3rd Edition.

General Disclaimer

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End of Safety Data Sheet