Product Safety Assessment

Stannous Fluoride


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Names
- CAS No. 7783-47-3
- Stannous fluoride
- Stannous difluoride
- Stannous Fluoride High Purity
- Tin(II) fluoride
- Tin difluoride
- Stannous Fluoride USP

Product Overview
- Stannous fluoride is a white solid.¹ For further details, see Product Description.
- Stannous fluoride is used in toothpastes and other dental preparations.² For further details, see Product Uses.
- Worker exposure to stannous fluoride is possible during manufacture, transport, or use. Consumers may be exposed to low concentrations of this product in dental hygiene preparations.³⁴ For further details, see Exposure Potential.
- Eye contact may result in serious eye damage. Skin contact may cause severe irritation and burns. Inhalation of dust may cause irritation to the respiratory tract. This product may be harmful if swallowed in large amounts.⁵ For further details, see Health Information and request the relevant Safety Data Sheet from the Dow Customer Information Group.
- When introduced to the environment, stannous fluoride will dissociate in water to form fluoride anions and tin hydroxides which range from slightly toxic to highly toxic to fish and other aquatic organisms.⁶⁷ For further details, see Environmental Information.
- Stannous fluoride is corrosive. Avoid contact with extreme heat, ignition sources, and reactive materials.⁸ For further details, see Physical Hazard Information.

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**Manufacture of Product**
- **Location** – The Dow Chemical Company and its global affiliates manufacture stannous fluoride at facilities in Buchs, Switzerland.
- **Process** – Stannous fluoride is produced commercially by the reaction of tin(II) oxide and aqueous hydrofluoric acid or by dissolving tin in anhydrous or aqueous hydrofluoric acid.

**Product Description**
Stannous fluoride is a white solid.

**Product Uses**
Stannous fluoride is used in the formulation of toothpastes and other dental preparations for the prevention of demineralization and decay of teeth.

**Exposure Potential**
Stannous fluoride is used in the production of dental and consumer products. Based on the uses for this product, individuals could be exposed through:
- **Workplace exposure** – Exposure can occur either in a facility that manufactures stannous fluoride or in the various industrial or manufacturing facilities that use this product. It is produced, distributed, stored, and consumed in closed systems. Those working with stannous fluoride in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Stannous fluoride is corrosive. Chemical resistant gloves and protective clothing are necessary. Each manufacturing facility should have a thorough training program for employees and appropriate work processes, ventilation, and safety equipment in place to limit exposure. See Health Information.
- **Consumer exposure to products containing stannous fluoride** – Dow does not sell stannous fluoride for direct consumer use, but it is used at low levels in products such as toothpastes and other dental preparations. Stannous fluoride is an active pharmaceutical ingredient in the United States and a cosmetic ingredient in the European Union. See Health Information.
- **Environmental releases** – In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. Respiratory protection is necessary for cleaning up spills and leaks. Upon release, stannous fluoride will dissociate in water to form fluoride anions and tin hydroxides. They will tend to bind to soil, suspended particles, or sediment and will likely be removed in biological wastewater treatment plants by adsorption to the biosolids. See Environmental, Health, and Physical Hazard Information.
- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, the material should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. Evacuate personnel to safe areas and ventilate the area. Avoid breathing vapor and avoid all contact. The floor may be slippery; use care to avoid falling. Soak up the material with inert absorbent material and sweep or vacuum up spillage. This material is corrosive. Wear appropriate protective clothing. If exposed to material during clean up operations, immediately remove all contaminated clothing and wash exposed skin with soap and water; wash contaminated clothing before re-use and do not launder contaminated clothing at home. Keep spills and cleaning runoff out of municipal sewers and open bodies of water. Spills on porous surfaces may contaminate groundwater. See Environmental, Health, and Physical Hazard Information.
- **In case of fire** – Deny any unnecessary entry into the area and consider the use of unmanned hose holders. Remain upwind and avoid breathing smoke. Use water spray, alcohol-resistant foam, carbon dioxide or dry-chemical extinguishers to fight the fire. Closed containers of this material may rupture from pressure build-up when exposed to fire or extreme heat. Move containers out of fire zone. If removal is impossible, cool containers with water spray. Contain runoff. During a fire, irritating or highly toxic gases and/or fumes may be generated during combustion or decomposition. Firefighters should wear self-contained breathing apparatus. This material is corrosive. If exposed to material as-is or mixed with runoff water during fire-fighting, immediately remove all contaminated clothing and wash exposed skin areas with soap and water. See Environmental, Health, and Physical Hazard Information.

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.
Health Information\textsuperscript{14,15}

**Eye contact** – Contact may cause serious eye damage. Avoid contact with product or product dust by wearing appropriate personal protective equipment.

**Skin contact** – Contact may cause severe skin irritation and burns.

**Inhalation** – Avoid contact with product dust by wearing appropriate personal protective equipment.

**Ingestion** – This product may be harmful if swallowed in large amounts.

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

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Environmental Information\textsuperscript{16,17}

Environmental information on stannous fluoride is summarized on the relevant Safety Data Sheet. An overview of environmental information appears below.

Stannous fluoride is water soluble and non-volatile. When released to the environment, it will dissociate in water to form fluoride anions and tin hydroxides. Fluoride anion and tin hydroxides are expected to bind to soil, suspended particles, or sediment. They would likely be removed in biological wastewater treatment plans by adsorption to biosolids. These products are not likely to accumulate in the food chain (bioconcentration potential is low) and they range from slightly toxic (LC\textsubscript{50}/EC\textsubscript{50} between 10 and 100 mg/L) to highly toxic (LC\textsubscript{50}/EC\textsubscript{50} between 0.1 and 1.0 mg/L) to fish and other aquatic organisms on an acute basis.

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

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Physical Hazard Information\textsuperscript{18}

Stannous fluoride is corrosive. Avoid extreme temperatures, sources of ignition, and direct sunlight. Avoid contact with strong oxidizing agents, strong acids, and strong bases.

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

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Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of stannous fluoride. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet or Contact Us.

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Additional Information

- Request the Safety Data Sheet from the Dow Customer Information Group [www.dow.com/assistance/dowcig.htm](http://www.dow.com/assistance/dowcig.htm)
- Contact Us [www.dow.com/assistance/dowcig.htm](http://www.dow.com/assistance/dowcig.htm)
- STANNOUS FLUORIDE - National Library of Medicine HSDB Database
- ICSC:NENG0860 International Chemical Safety Cards (WHO/IPCS/ILO) | CDC/NIOSH
For more business information about stannous fluoride, contact the Dow Customer Information Group at www.dow.com/assistance/dowcig.htm.

References


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