Material Safety Data Sheet

Tin Fluoborate

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

COMPANY DETAILS:
Triveni Chemicals
135 Pancharatna Char Rasta
G I D C Vapi.396195 Gujarat India
Tel. 91 260 2400022 / 3258683 Fax. 2400045

Product Name: TIN (II) FLUOBORATE

Synonyms: Stannous Fluoborate (Tetrafluoborate)

Use: Electroplating

UN Number: 3289

Proper Shipping Name: TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.

(STANNOUS FLUOROBORATE 47%, FLUOROBORIC ACID 4%)
Dangerous Goods Class: 6.1
Subsidiary risk: 8
Packing Group: II
Hazchem Code: 2X
Poison Schedule: S6

2. COMPOSITION / INFORMATION ON INGREDIENTS

SUBSTANCE NAME	Proportion	CAS Number
Stannous Fluoroborate	47.10%	13814-97-6
Fluoroboric Acid (HBF4)	3.7 - 4.9%	16872-11-0
Boric Acid	1.2%	10043-35-3
Hydrofluoric Acid (released from HBF4 in solution)	>0.5%	7664-39-3
Water	Balance	7732-18-5

3. HAZARD IDENTIFICATION

Hazard Category: Toxic, Corrosive

ACUTE HEALTH EFFECTS

Swallowed: Toxic if swallowed.

Will cause burns to the mouth, mucous membranes, throat, oesophagus and stomach. May cause headache, nausea and vomiting. If sufficient quantities are ingested (swallowed) death may occur.

Eye:
Will cause burns to the eyes with effects including: Pain, tearing, conjunctivitis and if duration of exposure is long enough, blindness will occur.
Skin:
Will cause burns to the skin, with effects including; Redness, blistering, localised pain and dermatitis.
Inhaled:
Will cause severe irritation to the nose, throat and respiratory system with effects including: coughing wheezing, laryngitis, shortness of breath. Inhalation may result in spasm, inflammation and edema of the larynx and brochi, chemical pneumonitis and pulmonary edema. Extremely destructive to tissue of the mucous membranes and upper respiratory tract.
CHRONIC:
Prolonged or repeated exposure may lead to irreversible damage to health. Prolonged exposure to fluoride dusts, vapours or mists results in perforation of the nasal septum. Chronic effects include excessive calcium precipitation by the fluoride ion in the bones, ligaments and tendons. Prolonged or repeated skin contact will lead to necrosis (death) of the skin.

Boric acid has been classified as a CATEGORY 3 TOXIC TO REPRODUCTION (WORKSAFE).
Substances suspected of impairing fertility and or possibly causing birth defects. Are those substances which have possible developmental toxicity effects on humans but in respect of which the available information is not adequate for making a satisfactory assessment. There is some evidence from appropriate animal or epidemiological studies, but this is insufficient to place the substance in Category 2.

4. FIRST AID MEASURES

Swallowed:
If swallowed, DO NOT induce vomiting. Seek urgent medical assistance.

Eye:
If material is splashed into eyes, flush with plenty of water for at least 15 minutes, ensuring eye lids are held open. Immediately transport to hospital or doctor.
Skin:
If material is splashed onto the skin, remove any contaminated clothing and wash skin thoroughly with water and soap if available.
Inhaled:
Remove victim to fresh air. Apply resuscitation if victim is not breathing - DO NOT USE DIRECT MOUTH - TO - MOUTH METHOD if victim ingested or inhaled substance; use alternative respiratory method or proper respiratory device - Administer oxygen if breathing is difficult.
First Aid Facilities:
Eye wash fountain, safety shower and normal wash room facilities.
Advice to Doctor:
Treat symptomatically. Symptoms of fluoride overexposure may include salivation, nausea, vomiting, abdominal pain, fever, laboured breathing. Fluoride ion can reduce serum calcium levels possibly causing fatal hypocalcemia. Prolonged exposure to fluoride dusts, vapours or mists results in perforation of the nasal septum. Chronic effects include excessive calcium precipitation by the fluoride ion in the bones, ligaments and tendons.

5. FIRE-FIGHTING MEASURES

Fire/Explosion Hazard
EXTINGUISHING MEDIA: Use dry chemical, carbon dioxide, foam or water spray.
SPECIAL FIRE FIGHTING PROCEDURES: Self-contained breathing apparatus (SCBA) required for fire-fighting personnel.
Flammability
Material does not burn. Containers may explode when heated. Runoff may pollute waterways.
Fire will produce irritating, toxic and / or corrosive gases.

6. ACCIDENTAL RELEASE MEASURES

EMERGENCY ACTION:
Keep unnecessary people away; Isolate hazard area and deny entry. Stay upwind; Keep out of low areas. Isolate for 100 m in all directions if tank, rail car or tanker truck is involved in fire.

SPILL OR LEAK PROCEDURE:
No flares, smoking or flames in hazard area as toxic decomposition products may be formed.

Stop leak if you can do it without risk.

SMALL SPILLS:
Neutralize with lime, soda ash or crushed limestone. Take up with sand, dirt or vermiculite. Place into labelled drum(s) for later disposal.
LARGE SPILLS: Notify Emergency Services (Police or Fire Brigade). Tell them location, nature and any information that would be helpful. Contain spill. Safely stop flow of spill. Bund area. Trained personnel should wear Personal Protective equipment as highlighted in this MSDS. Consult an expert regarding disposal of this product.

7. HANDLING AND STORAGE

Store in a cool place and out of direct sunlight. Store away from sources of heat or flames, strong alkalis, acids and oxidizing agents. Store in original packages as approved by manufacturer. Check all fittings, valves, reticulation (piping) and any ancillary equipment for leaks. A supplied air respirator or a Self-Contained Breathing Apparatus (SCBA) for emergencies should be available and checked regularly. For further information please refer to the Engineering Controls of this MSDS.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Standards
STANNOUS FLUOROBORATE: [TWA] 2 mg/m³ (Inorganic compounds as Sn)
FLUOROBORIC ACID : [TWA] 2.5 mg/m³ (as Fluoride)
BORIC ACID : [TWA] 5 mg/m³

Engineering Controls
Toxic and corrosive liquid. Single significant exposure may cause death. Maintain adequate ventilation at all times. At high temperatures the solution releases a hazardous mist. Prevent accumulation of vapours or mists in hollows or sumps.

Mechanical ventilation (dilution and local exhaust), and control of process conditions. Corrosion resistant materials may be needed where dust, mists and fumes may be formed. It may be necessary to consider process or personnel enclosure (fully enclosed systems).

If engineering controls and work practices are not effective in preventing or controlling exposure, then suitable personal protective equipment, which is known to perform satisfactorily, should be used.

Personal Protection Equipment
CLOTHING: PVC, Nitrile, Neoprene, Natural rubber or any other type of apron or splash suit as recommended by the manufacturer.
GLOVES: PVC, Nitrile, Neoprene, Natural rubber or any other type of glove as recommended by the manufacturer.
EYES: Chemical goggles or faceshield to protect eyes.

RESPIRATORY PROTECTION: Avoid breathing of vapours or mists. Select and use respirators in accordance with AS/NZS 1715/1716. When vapours or mists exceed the exposure standards then the use of an atmosphere-supplied, positive pressure demand self-contained or airline breathing apparatus supplied air respirator complying with the requirements of AS/NZS 1715 is recommended. Filter capacity and respirator type depends on exposure levels.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear, colourless solution with essentially no odour.
Boiling Point / Melting Point:	Not Available
Vapour Pressure:	Not Available
Specific Gravity:	1.6 approx.
Flash Point:	Not Applicable
Flammability Limits:	Not Applicable
pH:	2 approx.
Molecular Formula:	$Sn(BF_4)_2$ (Stannous Fluoroborate ingredient)
Molecular Weight:	292.2 (Stannous Fluoroborate ingredient)
Solubility in Water:	Complete, the product is an Aqueous Solution.

10. STABILITY AND REACTIVITY

STABILITY:

Stable under normal conditions of use. In dilute solution, some hydrolysis to hydrofluoric acid may occur.

HAZARDOUS DECOMPOSITION PRODUCTS:

At high temperatures the solution releases a hazardous mist of the ingredients. Emits acrid smoke and fumes when heated to decomposition and may release tin oxides, borates, stannous fluoride, boron trifluoride (speculative), fluoride compounds, and may form hydrogen fluoride in contact with strong acids.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:
Stannous Fluoborate is acidic and will react with acid incompatible materials, eg bases, sulfides, cyanides. It may react vigourosly with strong oxidizing agents. Corrosive to aluminium.

CONDITIONS TO AVOID:

Heat, flames and incompatibles.

11. TOXICOLOGICAL INFORMATION

Acute Oral Toxicity (rat): 20-50 mg/kg (Liquid, Packing Group II toxicity range & Hazardous Substances Toxic Range)
Chronic Effects: Target organs - liver, kidney, lungs, eyes, skin, bones.

12. ECOLOGICAL INFORMATION

This substance is harmful to aquatic organisms. This substance may cause long term adverse effects in the environment. Avoid contaminating waterways.

Acute aquatic toxicity LC50 (rainbow trout, 24 hrs) : 80 mg/L

Acute aquatic toxicity LC50 (rainbow trout, 96 hrs) : 78 mg/L

Acute aquatic toxicity LC50 (daphnia magna, 24 & 48 hrs) : 87 mg/L

13. DISPOSAL CONSIDERATIONS

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste by an approved waste agency. Processing, use or contamination of this product may change the waste management options. The waste should be neutralised with lime in order to immobilise the fluoride as Calcium Fluoride.
Dispose of container and unused contents in accordance with federal, state and local requirements.
Advise toxic, corrosive nature. Must be chemically treated to an inert material prior to disposal in landfill.

14. TRANSPORT INFORMATION

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Subsidiary risk: 8
Packing Group: II
Hazchem Code: 2X

Emergency information(Transport):

Dangerous Goods - Initial Emergency Response Guide (SAA/SNZ HB76:1997)
For TOXIC AND/OR CORROSIVE SUBSTANCES - Guide No: 37

15. REGULATORY INFORMATION

Workplace Hazardous Substance
HAZARD CATEGORY: TOXIC, CORROSIVE
RISK PHRASES
R25 Toxic if swallowed.
R34 Causes burns.

SAFETY PHRASES

S1/2 Keep locked up and out of reach of children.
S53 Avoid exposure - obtain special instructions before use.
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28 After contact with skin wash immediately with plenty of water and apply calcium gluconate gel to the affected area.
S27 Take off immediately all contaminated clothing.
S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible).
Poison Schedule: S6
Scheduled due to >0.5% HF

16. OTHER INFORMATION

Contact Point
Technical Department After Hours

Disclaimer
The information herein is to the best of our knowledge, correct and complete. It descibes the safety requirements for this product and should not be construed as guaranteeing specific properties. Since methods and conditions are beyond our control we do not accept liability for any damages resulting from the use of, or reliance on, this information in inappropriate contexts.