

FLUOROBORIC ACID ABT.40%

GHS Safety Data Sheet

Version No:2.0

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Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

FLUOBORIC ACID

OTHER NAMES

BF₄H, HBF₄, "fluoroboric acid", "borofluoric acid", "hydrofluoboric acid", "hydrofluoroboric acid", "hydroborofluoric acid", "tetrafluoro hydrogen borate", "tetrafluoroboric acid", "hydrogen tetrafluoroborate"

PROPER SHIPPING NAME

FLUOROBORIC ACID

PRODUCT USE

Used in the production of fluoborates, in the electrolytic brightening of aluminium, as a throwing power aid in electrolytic plating baths, in metal cleaning, in making stabilised diazo salts, in the production of acetals and as a esterification catalyst. Laboratory reagent.

SUPPLIER

Company: S D FINE- CHEM LIMITED

Address:

315- 317, T.V. INDUSTRIAL ESTATE,

248, WORLI,

MUMBAI- 400030.INDIA.

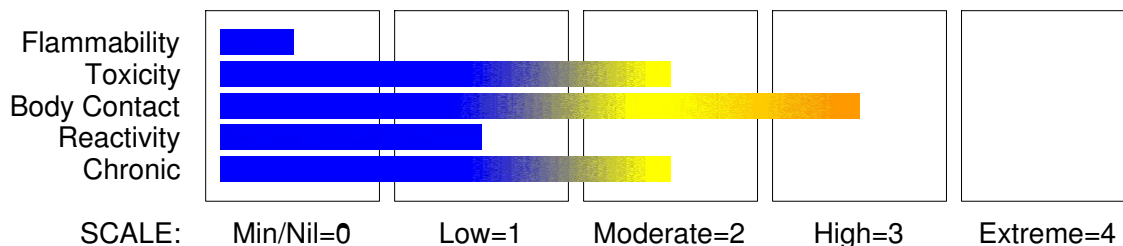
technical@sdfine.com

Telephone: 91- 22- 24959898

Telephone: 91- 22- 24959899

Fax: 91- 22- 24937232

HAZARD RATINGS



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Section 2 - HAZARDS IDENTIFICATION

GHS Classification

Acute Toxicity (Oral) Category 3

Metal Corrosion Category 1

Skin Corrosion/Irritation Category 1B



EMERGENCY OVERVIEW

HAZARD

DANGER

Determined by using GHS criteria:

H301 H290 H314

Toxic if swallowed

May be corrosive to metals

Causes severe skin burns and eye damage

PRECAUTIONARY STATEMENTS

Prevention

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

Wash thoroughly after handling.

Wear protective gloves/clothing and eye/face protection.

Wash hands thoroughly after handling.

Do not breathe dust or mist.

Response

IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.

Immediately call a POISON CENTER or doctor/physician.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Wash contaminated clothing before reuse.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

Absorb spillage to prevent material damage.

If on skin or hair: remove/take off immediately all contaminated clothing. Rinse with water/shower.

Specific treatment: refer to Label or MSDS.

Storage

Store locked up.

Store in a corrosive resistant container with a resistant liner.

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Section 2 - HAZARDS IDENTIFICATION

Disposal

Dispose of contents and container in accordance with relevant legislation.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
fluoboric acid	16872-11-0	40 - 50
water	7732-18-5	60 - 50
hydrofluoric acid	7664-39-3	trace

Section 4 - FIRST AID MEASURES

SWALLOWED

For advice, contact a Poisons Information Centre or a doctor.

· IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.

· For advice, contact a Poisons Information Centre or a doctor.

Where Medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:

· Induce vomiting with fingers down the back of the of the throat, ONLY IF CONSCIOUS.

· Lean patient forward or place on left side (head-down position if possible) to maintain open airway and prevent aspiration.

NOTE: Wear a protective glove when inducing vomiting by mechanical means.

· In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.

· If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the MSDS should be provided.

Further action will be the responsibility of the medical specialist.

· If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the MSDS.

EYE

If this product comes in contact with the eyes:

· Immediately hold eyelids apart and flush the eye continuously with running water.

· Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

· Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.

· Transport to hospital or doctor without delay.

· Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin or hair contact occurs:

· Immediately flush body and clothes with large amounts of water, using safety shower if available.

· Quickly remove all contaminated clothing, including footwear.

· Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.

· Transport to hospital, or doctor.

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Section 4 - FIRST AID MEASURES

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor.

NOTES TO PHYSICIAN

For acute or short term repeated exposures to strong acids:

- Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
- Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling
- Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
- Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues.

INGESTION:

- Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
- DO NOT attempt to neutralise the acid since exothermic reaction may extend the corrosive injury.
- Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
- Charcoal has no place in acid management.
- Some authors suggest the use of lavage within 1 hour of ingestion.

SKIN:

- Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
- Deep second-degree burns may benefit from topical silver sulfadiazine.

EYE:

- Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival cul-de-sacs. Irrigation should last at least 20-30 minutes. DO NOT use neutralising agents or any other additives. Several litres of saline are required.
- Cycloplegic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
- Steroid eye drops should only be administered with the approval of a consulting ophthalmologist).

[Ellenhorn and Barceloux: Medical Toxicology].

For acute or short term repeated exposures to fluorides:

- Fluoride absorption from gastro-intestinal tract may be retarded by calcium salts, milk or antacids.
- Fluoride particulates or fume may be absorbed through the respiratory tract with 20-30% deposited at alveolar level.
- Peak serum levels are reached 30 mins. post-exposure; 50% appears in the urine within 24 hours.
- For acute poisoning (endotracheal intubation if inadequate tidal volume), monitor breathing and evaluate/monitor blood pressure and pulse frequently since shock may supervene with little warning. Monitor ECG immediately; watch for arrhythmias and evidence of Q-T prolongation or T-wave changes. Maintain monitor. Treat shock vigorously with isotonic saline (in 5% glucose) to restore blood volume and enhance renal excretion.

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Section 4 - FIRST AID MEASURES

- Where evidence of hypocalcaemic or normocalcaemic tetany exists, calcium gluconate (10 ml of a 10% solution) is injected to avoid tachycardia.

BIOLOGICAL EXPOSURE INDEX - BEI

These represent the determinants observed in specimens collected from a healthy worker exposed at the Exposure Standard (ES or TLV):

Determinant	Index	Sampling Time	Comments
Fluorides in urine	3 mg/gm creatinine	Prior to shift	B, NS
	10mg/gm creatinine	End of shift	B, NS

B: Background levels occur in specimens collected from subjects NOT exposed

NS: Non-specific determinant; also observed after exposure to other exposures.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- Use extinguishing media suitable for surrounding area.

FIRE FIGHTING

Alert Fire Brigade and tell them location and nature of hazard.

Clear area of personnel and move upwind.

- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water courses.

Use fire fighting procedures suitable for surrounding area.

If safe to do so, switch off electrical equipment until vapour fire hazard is removed.

Cool fire exposed containers with water spray from a protected location.

DO NOT approach containers suspected to be hot.

If safe to do so, remove containers from path of fire.

Equipment should be thoroughly decontaminated after use.

FIRE/EXPLOSION HAZARD

Non combustible liquid.

Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.

If involved in fire emits toxic fumes of, hydrogen fluoride, fluorides.

Heating may cause expansion or decomposition leading to violent rupture of containers.

FIRE INCOMPATIBILITY

Avoid reaction with oxidising agents, metals, strong alkalis, reducing agents, cyanides and combustible materials.

Personal Protective Equipment

Breathing apparatus.

Gas tight chemical resistant suit.

Limit exposure duration to 1 BA set 30 mins.

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Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS

Clear area of personnel.

Avoid breathing vapours and contact with skin and eyes.

Wipe up and absorb small quantities with vermiculite or other absorbent material. Place in suitable containers for disposal.

MAJOR SPILLS

Alert Fire Brigade and tell them location and nature of hazard.

Clear area of personnel and move upwind.

- Wear full body protective clothing with breathing apparatus.

- Prevent, by any means available, spillage from entering drains or water courses.

Shut off all possible sources of ignition and increase ventilation.

No smoking or naked lights within area.

Stop leak if safe to do so.

Absorb or cover spill with sand, earth, inert material or vermiculite.

Use soda ash or slaked lime to neutralise.

Recover liquid and place in labelled, sealable container for recycling.

Collect residues and seal in labelled drums for disposal.

Spread area with lime and leave for at least 1 hour before washing.

If contamination of drains or waterways occurs, advise emergency services.

If equipment is grossly contaminated, decontaminate and destroy.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

fluoboric acid 40 mg/m³

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

fluoboric acid 7.5 mg/m³

other than mild, transient adverse effects without perceiving a clearly defined odour is:

fluoboric acid 3 mg/m³

The threshold concentration below which most people will experience no appreciable risk of health effects:

fluoboric acid 3 mg/m³

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+)	>= 0.1%	Toxic (T)	>= 3.0%
R50	>= 0.25%	Corrosive (C)	>= 5.0%
R51	>= 2.5%		
else	>= 10%		

where percentage is percentage of ingredient found in the mixture

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Section 6 - ACCIDENTAL RELEASE MEASURES

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



+ + + + + +

+: May be stored together

O: May be stored together with specific precautions

X: Must not be stored together

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Limit all unnecessary personal contact.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

SUITABLE CONTAINER

- Check that containers are clearly labelled.
- Packaging as recommended by manufacturer.
Plastic container . Plastic carboy.
Plastic drum . Steel drum with plastic liner.

STORAGE INCOMPATIBILITY

Avoid storage with incompatible substances.
Incompatible with, metals, strong alkalis, cyanides, oxidising agents and reducing agents.
Incompatible substances also include sulphides and acetic anhydride.

STORAGE REQUIREMENTS

- Keep dry.
- Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials.
- Protect containers against physical damage.
- Check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

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Section 7 - HANDLING AND STORAGE

Store in a cool area and away from sunlight.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records

• fluoboric acid:

CAS:16872- 11- 0 CAS:74618- 51- 2 CAS:122141- 73- 5 CAS:127408- 00- 8 CAS:65814- 43- 9
CAS:133097- 00- 4 CAS:350009- 05- 1 CAS:191665- 41- 5 CAS:183135- 74- 2 CAS:1303- 67- 9
CAS:67116- 13- 6 CAS:96958- 96- 2 CAS:102931- 96- 4 CAS:172515- 29- 6 CAS:547767- 06- 6
CAS:133951- 38- 9 CAS:13767- 36- 7 CAS:496925- 14- 5 CAS:172908- 18- 8 CAS:81586- 24- 5
CAS:36835- 64- 0 CAS:72802- 72- 3 CAS:140148- 87- 4

• water:

CAS:7732- 18- 5 CAS:558440- 53- 2 CAS:558440- 22- 5

ODOUR SAFETY FACTOR (OSF)

OSF=71 (fluoboric acid)

Exposed individuals are reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odour Safety Factor (OSF) is determined to fall into either Class A or B.

The Odour Safety Factor (OSF) is defined as:

OSF= Exposure Standard (TWA) ppm/ Odour Threshold Value (OTV) ppm

Classification into classes follows:

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV- TWA for example) is being reached, even when distracted by working activities
B	26- 550	As " A" for 50- 90% of persons being distracted
C	1- 26	As " A" for less than 50% of persons being distracted
D	0.18- 1	10- 50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	As " D" for less than 10% of persons aware of being tested

MATERIAL DATA

Based on a study in which the threshold for minimum increase in bone density due to fluoride exposure was 3.38 mg/m³ (as fluoride), the present TLV-TWA has been adopted to

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

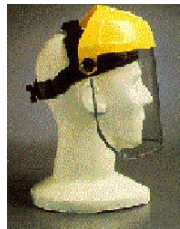
prevent irritant effects and disabling bone changes. There is also support for the proposition that occupational exposure below the TLV will have no adverse effect on pregnant women or off-spring. IARC has classified fluorides in drinking water as Group 3 carcinogens; i.e. Not classifiable as to its carcinogenicity to humans. Equivocal evidence of carcinogenic activity (osteosarcoma) has been found in male rats administered sodium fluoride in drinking water. (0-175 ppm) Evidence was not found in female rats or in male or female mice.

INGREDIENT DATA

WATER:

No exposure limits set by NOHSC or ACGIH.

PERSONAL PROTECTION



OR

EYE

- Chemical goggles.
- Full face shield may be required for supplementary but never for primary protection of eyes
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET

Impervious, gauntlet length gloves.

Rubber Gloves.

OTHER

- Full protective suit . Rubber apron.
 - Eyewash unit. Ensure there is ready access to a safety shower.
- Always ensure that a supply, is on hand, of calcium gluconate gel for treatment of burns and calcium carbonate tablets for accidental ingestion.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

For further information consult

your

Occupational Health and Safety Advisor.

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

Local exhaust ventilation may be required for safe working, i.e. to keep exposures below required standards, otherwise PPE is required.

SAA approved acid-vapour respirator or full-face air supplied breathing apparatus.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Colourless, clear, corrosive, toxic liquid with an acrid odour; mixes with water and alcohol.

PHYSICAL PROPERTIES

Liquid.

Mixes with water.

Corrosive.

Acid.

Molecular Weight: 87.82

Melting Range (°C): - 75

Solubility in water (g/L): Miscible

pH (1% solution): <1

Volatile Component (%vol): 100

Relative Vapour Density (air=1): 3.0

Lower Explosive Limit (%): Not applicable

Autoignition Temp (°C): Not applicable

State: Liquid

Boiling Range (°C): 130 (decomposes)

Specific Gravity (water=1): 1.23 to 1.37

pH (as supplied): <1

Vapour Pressure (kPa): 0.7 to 1.4 @ 20

Evaporation Rate: 0.5 BuAc=1

Flash Point (°C): Not applicable

Upper Explosive Limit (%): Not applicable

Decomposition Temp (°C): Not available

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

Presence of incompatible materials.

Storage in unsealed containers.

Stable under normal storage conditions.

Hazardous polymerisation will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.

EYE

The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating.

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Section 11 - TOXICOLOGICAL INFORMATION

When applied to the eye(s) of animals, the material produces severe ocular lesions which are present twenty-four hours or more after instillation.

The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

SKIN

The material can produce chemical burns following direct contact with the skin.

The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling the epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

INHALED

Evidence shows, or practical experience predicts, that the material produces irritation of the respiratory system in a substantial number of individuals following inhalation.

Acute effects of fluoride inhalation include irritation of nose and throat, coughing and chest discomfort.

A single acute over-exposure may even cause nose bleed. Pre-existing respiratory conditions such as emphysema, bronchitis may be aggravated by exposure. Occupational asthma may result from exposure.

The material may produce respiratory tract irritation. Symptoms of pulmonary irritation may include coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and a burning sensation.

Unlike most organs, the lung can respond to a chemical insult or a chemical agent, by first removing or neutralising the irritant and then repairing the damage (inflammation of the lungs may be a consequence).

The repair process (which initially developed to protect mammalian lungs from foreign matter and antigens) may, however, cause further damage to the lungs (fibrosis for example) when activated by hazardous chemicals. Often, this results in an impairment of gas exchange, the primary function of the lungs. Therefore prolonged exposure to respiratory irritants may cause sustained breathing difficulties.

CHRONIC HEALTH EFFECTS

Principal routes of exposure are usually by skin contact / eye contact.

Fluoborates stand apart from other inorganic fluorides in that they are not stored in the bone and excretion (mainly in the urine) exceeds hydrolysis leaving little opportunity for fluoride ion storage. However fluoborates do accumulate in the thyroid gland preventing uptake of iodine. Animal testing (rat) shows evidence that chronic boron trifluoride exposure may cause elevated levels of bone fluoride and dental fluorosis.

The substance is capable of causing severe and potentially fatal blood calcium deficiency, teeth and bone changes, asthma and symptoms resembling rheumatism. Sufferers of bronchitis and asthma may be affected worse than others. (UW&R-CCINFO)

TOXICITY AND IRRITATION

Not available.

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances

WATER:

No significant acute toxicological data identified in literature search.

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Section 12 - ECOLOGICAL INFORMATION

No data for fluoboric acid.

Section 13 - DISPOSAL CONSIDERATIONS

- Recycle wherever possible or consult manufacturer for recycling options.
 - Consult State Land Waste Management Authority for disposal.
 - Treat and neutralise with slaked lime at an effluent treatment plant.
 - Recycle containers, otherwise dispose of in an authorised landfill.
- Decontaminate empty containers.

Section 14 - TRANSPORTATION INFORMATION



Labels Required: CORROSIVE
HAZCHEM: 2X

UNDG:

Dangerous Goods Class: 8
UN Number: 1775
Shipping Name: FLUOROBORIC ACID

Subrisk: None
Packing Group: II

Air Transport IATA:

ICAO/IATA Class: 8
UN/ID Number: 1775
ERG Code: 8L
Shipping name: FLUOROBORIC ACID

ICAO/IATA Subrisk: None
Packing Group: II

Maritime Transport IMDG:

IMDG Class: 8
UN Number: 1775
EMS Number: F- A, S- B
Shipping name: FLUOROBORIC ACID

IMDG Subrisk: None
Packing Group: II

Section 15 - REGULATORY INFORMATION

REGULATIONS

fluoboric acid (CAS: 16872-11-0) is found on the following regulatory lists;
International Council of Chemical Associations (ICCA) - High Production Volume List

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Section 15 - REGULATORY INFORMATION

OECD Representative List of High Production Volume (HPV) Chemicals

No data available for fluoboric acid as CAS: 74618-51-2, CAS: 122141-73-5, CAS: 127408-00-8, CAS: 65814-43-9, CAS: 133097-00-4, CAS: 350009-05-1, CAS: 191665-41-5, CAS: 183135-74-2, CAS: 1303-67-9, CAS: 67116-13-6, CAS: 96958-96-2, CAS: 102931-96-4, CAS: 172515-29-6, CAS: 547767-06-6, CAS: 133951-38-9, CAS: 13767-36-7, CAS: 496925-14-5, CAS: 172908-18-8, CAS: 81586-24-5, CAS: 36835-64-0, CAS: 72802-72-3, CAS: 140148-87-4.

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
fluoboric acid	16872- 11- 0, 74618- 51- 2, 122141- 73- 5, 127408- 00- 8, 65814- 43- 9, 133097- 00- 4, 350009- 05- 1, 191665- 41- 5, 183135 - 74- 2, 1303- 67- 9, 67116- 13- 6, 96958- 96- 2, 102931- 96- 4, 172515- 29- 6, 547767- 06- 6, 133951- 38- 9, 13767- 36- 7, 496925- 14- 5, 172908- 18- 8, 81586- 24- 5, 36835- 64- 0, 72802- 72 - 3, 140148- 87- 4
water	7732- 18- 5, 558440- 53- 2, 558440- 22- 5

The above information is believed to be accurate and represent the best information currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

Issue Date: 5-Apr-2018