

## 1 Identification

### Product identifier

**Product name:** Boron trifluoride

**Stock number:** 22874

**CAS Number:**  
7637-07-2

**EC number:**  
237-383-0

**Index number:**  
005-001-00-X

**Relevant identified uses of the substance or mixture and uses advised against.**

**Identified use:** SU24 Scientific research and development

### Details of the supplier of the safety data sheet

#### Manufacturer/Supplier:

Alfa Aesar  
 Thermo Fisher Scientific Chemicals, Inc.  
 30 Bond Street  
 Ward Hill, MA 01835-8099  
 Tel: 800-343-0660  
 Fax: 800-322-4757  
 Email: tech@alfa.com  
 www.alfa.com

**Information Department:** Health, Safety and Environmental Department

#### Emergency telephone number:

During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

## 2 Hazard(s) identification

### Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)



GHS06 Skull and crossbones

Acute Tox. 2 H330 Fatal if inhaled.



GHS05 Corrosion

Skin Corr. 1A H314 Causes severe skin burns and eye damage.

Eye Dam. 1 H318 Causes serious eye damage.

**Hazards not otherwise classified** No information known.

### Label elements

**GHS label elements** The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

### Hazard pictograms



GHS05 GHS06

**Signal word** Danger

### Hazard statements

H330 Fatal if inhaled.

H314 Causes severe skin burns and eye damage.

### Precautionary statements

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P309 IF exposed or if you feel unwell:

P310 Immediately call a POISON CENTER/doctor/...

P302+P352 IF ON SKIN: Wash with plenty of water/...

P403 Store in a well-ventilated place.

### WHMIS classification

A - Compressed gas

D1A - Very toxic material causing immediate and serious toxic effects

D2B - Toxic material causing other toxic effects

E - Corrosive material



### Classification system

#### HMIS ratings (scale 0-4)

(Hazardous Materials Identification System)

**HEALTH** 4 Health (acute effects) = 4

**FIRE** 0 Flammability = 0

**REACTIVITY** 2 Physical Hazard = 2

### Other hazards

#### Results of PBT and vPvB assessment

**PBT:** Not applicable.

**vPvB:** Not applicable.

## 3 Composition/information on ingredients

### Chemical characterization: Substances

#### CAS# Description:

7637-07-2 Boron trifluoride

#### Identification number(s):

EC number: 237-383-0

Product name: **Boron trifluoride**

Index number: 005-001-00-X

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#### 4 First-aid measures

##### Description of first aid measures

##### General information

Immediately remove any clothing soiled by the product.  
Remove breathing apparatus only after contaminated clothing has been completely removed.  
In case of irregular breathing or respiratory arrest provide artificial respiration.

##### After inhalation

Supply fresh air. If required, provide artificial respiration. Keep patient warm.  
Seek immediate medical advice.

##### After skin contact

Immediately wash with water and soap and rinse thoroughly.  
Seek immediate medical advice.

**After eye contact** Rinse opened eye for several minutes under running water. Then consult a doctor.

**After swallowing** Seek medical treatment.

##### Information for doctor

##### Most important symptoms and effects, both acute and delayed

Causes severe skin burns.  
Causes serious eye damage.

**Indication of any immediate medical attention and special treatment needed** No further relevant information available.

#### 5 Fire-fighting measures

##### Extinguishing media

**Suitable extinguishing agents** Product is not flammable. Use fire-fighting measures that suit the surrounding fire.

**For safety reasons unsuitable extinguishing agents** Water

##### Special hazards arising from the substance or mixture

Reacts violently with water  
If this product is involved in a fire, the following can be released:

Boron oxide

Hydrogen fluoride (HF)

##### Advice for firefighters

##### Protective equipment:

Wear self-contained respirator.  
Wear fully protective impervious suit.

#### 6 Accidental release measures

##### Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

**Environmental precautions:** Inform authorities in case of gas release.

##### Methods and material for containment and cleaning up:

Use neutralizing agent.

Dispose of contaminated material as waste according to section 13.

Ensure adequate ventilation.

Do not flush with water or aqueous cleansing agents

**Prevention of secondary hazards:** No special measures required.

##### Reference to other sections

See Section 7 for information on safe handling

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

#### 7 Handling and storage

##### Handling

##### Precautions for safe handling

Handle under dry protective gas.

Keep container tightly sealed.

Store in cool, dry place in tightly closed containers.

Ensure good ventilation at the workplace.

Open and handle container with care.

Only handle and refill product in closed systems.

**Information about protection against explosions and fires:** The product is not flammable

##### Conditions for safe storage, including any incompatibilities

##### Storage

**Requirements to be met by storerooms and receptacles:** No special requirements.

##### Information about storage in one common storage facility:

Store away from oxidizing agents.

Store away from strong bases.

Store away from water/moisture.

##### Further information about storage conditions:

Store under dry inert gas.

This product is moisture sensitive.

Protect from humidity and water.

Keep container tightly sealed.

Store in cool, dry conditions in well sealed containers.

**Specific end use(s)** No further relevant information available.

#### 8 Exposure controls/personal protection

##### Additional information about design of technical systems:

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

##### Control parameters

##### Components with limit values that require monitoring at the workplace:

Boron trifluoride (gas)  
ppm  
ACGIH TLV 1-STEEL  
Belgium TWA 1  
Denmark TWA 1  
Finland TWA 1; 3-STEEL  
France TWA 1

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USA

**Product name: Boron trifluoride**

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Ireland TWA 1  
Netherlands TWA 1  
Russia TWA 0.3 mg/m<sup>3</sup>; 1 mg/m<sup>3</sup>-STEL  
Switzerland TWA 1; 2-STEL  
United Kingdom TWA 1-STEL  
USA PEL 1

Fluorides (as F)  
mg/m<sup>3</sup>  
ACGIH TLV 2.5  
Austria MAK 2.5  
Belgium TWA 2.5  
Finland TWA 2.5  
France TWA 2.5  
Germany MAK 2.5  
Hungary TWA 1; 2-STEL  
Netherlands MAC-K 3.5  
Norway TWA 0.6  
Poland TWA 1; 3-STEL  
Sweden NGV 2  
Switzerland MAK-W 1.5; 3-KZG-W  
United Kingdom TWA 2.5  
Russia TWA 2  
Denmark TWA 2.5  
USA PEL 2.5

**7637-07-2 Boron trifluoride (100.0%)**

PEL (USA) Ceiling limit value: 3 mg/m<sup>3</sup>, 1 ppm  
REL (USA) Ceiling limit value: 3 mg/m<sup>3</sup>, 1 ppm  
TLV (USA) Ceiling limit value: 2.8 mg/m<sup>3</sup>, 1 ppm  
EL (Canada) Short-term value: C 1 ppm

**Additional information:** No data

**Exposure controls**

**Personal protective equipment**

**General protective and hygienic measures**

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Avoid contact with the eyes and skin.

Maintain an ergonomically appropriate working environment.

**Breathing equipment:** Use self-contained respiratory protective device in emergency situations.

**Protection of hands:**

Impervious gloves

Check protective gloves prior to each use for their proper condition.

The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

**Penetration time of glove material (in minutes)** Not determined

**Eye protection:**

Tightly sealed goggles

Full face protection

**Body protection:** Protective work clothing.

**9 Physical and chemical properties**

**Information on basic physical and chemical properties**

**General Information**

**Appearance:**

**Form:** Compressed gas

**Color:** Colorless

**Odor:** Pungent

**Odor threshold:** Not determined.

**pH-value:** Not determined.

**Change in condition**

**Melting point/Melting range:** -127.1 °C (-197 °F)

**Boiling point/Boiling range:** -100.4 °C (-149 °F)

**Sublimation temperature / start:** Not determined

**Flammability (solid, gaseous)** Not determined.

**Ignition temperature:** Not determined

**Decomposition temperature:** Not determined

**Auto igniting:** Not determined.

**Danger of explosion:** Product does not present an explosion hazard.

**Explosion limits:**

**Lower:** Not determined

**Upper:** Not determined

**Vapor pressure:** Not determined

**Density at 20 °C (68 °F):** 0.003076 g/cm<sup>3</sup> (0.026 lbs/gal)

**Relative density** Not determined.

**Vapor density** Not determined.

**Evaporation rate** Not applicable.

**Solubility in / Miscibility with**

**Water:** Reacts violently

**Partition coefficient (n-octanol/water):** Not determined.

**Viscosity:**

**dynamic:** Not determined.

**kinematic:** Not determined.

**Other information** No further relevant information available.

**10 Stability and reactivity**

**Reactivity** Reacts violently with water.

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USA

Product name: **Boron trifluoride**

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**Chemical stability** Stable under recommended storage conditions.  
**Thermal decomposition / conditions to be avoided:** Decomposition will not occur if used and stored according to specifications.  
**Possibility of hazardous reactions** Reacts violently with water  
**Conditions to avoid** No further relevant information available.  
**Incompatible materials:**  
 Oxidizing agents  
 Bases  
 Water/moisture  
**Hazardous decomposition products:**  
 Boron oxide  
 Hydrogen fluoride

**11 Toxicological information**

**Information on toxicological effects**  
**Acute toxicity:**  
 Fatal if inhaled.  
 Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.  
**LD/LC50 values that are relevant for classification:**  
 Inhalative LC50/4H 1180 mg/m<sup>3</sup>/4H (rat)  
**Skin irritation or corrosion:** Causes severe skin burns.  
**Eye irritation or corrosion:** Causes serious eye damage.  
**Sensitization:** No sensitizing effects known.  
**Germ cell mutagenicity:** No effects known.  
**Carcinogenicity:** No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.  
**Reproductive toxicity:** No effects known.  
**Specific target organ system toxicity - repeated exposure:** No effects known.  
**Specific target organ system toxicity - single exposure:** No effects known.  
**Aspiration hazard:** No effects known.  
**Subacute to chronic toxicity:**  
 Fluorides may cause salivation, nausea, vomiting, diarrhea and abdominal pain, followed by weakness, tremors, shallow respiration, convulsions and coma. May cause brain and kidney damage. Chronic fluoride poisoning can cause severe bone changes, loss of weight, anorexia, anemia and dental defects.  
**Subacute to chronic toxicity:** No effects known.  
**Subacute to chronic toxicity:**  
 Boron affects the central nervous system. Boron poisoning causes depression of the circulation, persistent vomiting and diarrhea, followed by profound shock and coma. The temperature may become subnormal and a scarletina form rash may cover the entire body.  
**Additional toxicological information:** To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

**12 Ecological information**

**Toxicity**  
**Aquatic toxicity:** No further relevant information available.  
**Persistence and degradability** No further relevant information available.  
**Bioaccumulative potential** No further relevant information available.  
**Mobility in soil** No further relevant information available.  
**Additional ecological information:**  
**General notes:**  
 Do not allow material to be released to the environment without proper governmental permits.  
 Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.  
 Avoid transfer into the environment.  
**Results of PBT and vPvB assessment**  
**PBT:** Not applicable.  
**vPvB:** Not applicable.  
**Other adverse effects** No further relevant information available.

**13 Disposal considerations**

**Waste treatment methods**  
**Recommendation** Consult state, local or national regulations to ensure proper disposal.  
**Uncleaned packagings:**  
**Recommendation:** Disposal must be made according to official regulations.

**14 Transport information**

<b>UN-Number</b>	UN1008
<b>DOT, IMDG, IATA</b>	
<b>UN proper shipping name</b>	Boron trifluoride
<b>DOT</b>	BORON TRIFLUORIDE
<b>IMDG, IATA</b>	
<b>Transport hazard class(es)</b>	
<b>DOT</b>	
	
	
<b>Class</b>	2.3
<b>Label</b>	2.3+8
<b>Class</b>	2.3 2TC
<b>Label</b>	2.3+8
<b>IMDG, IATA</b>	
	
	
<b>Class</b>	2.3
<b>Label</b>	2.3+8
<b>Packing group</b>	
<b>DOT, IMDG, IATA</b>	Not applicable
<b>Environmental hazards:</b>	Not applicable.
<b>Special precautions for user</b>	Not applicable.

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USA

**Product name: Boron trifluoride**

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**Poison inhalation hazard:** Yes  
**EMS Number:** F-C,S-U

**Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not applicable.

**Transport/Additional information:**

**DOT**  
**Marine Pollutant (DOT):** No  
**UN "Model Regulation":** UN1008, Boron trifluoride, 2.3 (8)

## 15 Regulatory information

**Safety, health and environmental regulations/legislation specific for the substance or mixture**  
**GHS label elements** The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)  
**Hazard pictograms**



GHS05 GHS06

**Signal word** Danger

**Hazard statements**

H330 Fatal if inhaled.  
H314 Causes severe skin burns and eye damage.

**Precautionary statements**

P280 Wear protective gloves/protective clothing/eye protection/face protection.  
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P309 IF exposed or if you feel unwell:  
P310 Immediately call a POISON CENTER/doctor/...  
P302+P352 IF ON SKIN: Wash with plenty of water/...  
P403 Store in a well-ventilated place.

**National regulations**

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.  
All components of this product are listed on the Canadian Domestic Substances List (DSL).

**SARA Section 313 (specific toxic chemical listings)**

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**California Proposition 65**

**Prop 65 - Chemicals known to cause cancer** Substance is not listed.

**Prop 65 - Developmental toxicity** Substance is not listed.

**Prop 65 - Developmental toxicity, female** Substance is not listed.

**Prop 65 - Developmental toxicity, male** Substance is not listed.

**Information about limitation of use:**

For use only by technically qualified individuals.

This product is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

**Other regulations, limitations and prohibitive regulations**

**Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.** Substance is not listed.

**The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.**

Substance is not listed.

**Annex XIV of the REACH Regulations (requiring Authorisation for use)** Substance is not listed.

**Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

## 16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing SDS:** Global Marketing Department

**Date of preparation / last revision** 11/24/2015 / -

**Abbreviations and acronyms:**

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

ICAO: International Civil Aviation Organization

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

HMIS: Hazardous Materials Identification System (USA)

WHMIS: Workplace Hazardous Materials Information System (Canada)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

vPvB: very Persistent and very Bioaccumulative

ACGIH: American Conference of Governmental Industrial Hygienists (USA)

OSHA: Occupational Safety and Health Administration (USA)

NTP: National Toxicology Program (USA)

IARC: International Agency for Research on Cancer

EPA: Environmental Protection Agency (USA)