



# Boron trifluoride

## Safety Data Sheet E-4567

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979

Revision date: 07-28-2023

Supersedes: 01-01-2021

Version: 1.1

### SECTION 1: Identification

#### 1.1. Product identifier

Product form	: Substance
Trade name	: Boron trifluoride
CAS No	: 7637-07-2
Formula	: BF <sub>3</sub>
Other means of identification	: Boron trifluoride
Product group	: Core Products

#### 1.2. Recommended use and restrictions on use

Recommended uses and restrictions	: Industrial use, Use as directed.
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#### 1.3. Supplier

Linde Canada inc.  
500 — 5015 Spectrum Way  
Mississauga - Canada L4W 0E4  
T 1-905-803-1600 - F 1-905-803-1682  
[www.lindecana.ca](http://www.lindecana.ca)

#### 1.4. Emergency telephone number

Emergency number	: 1-800-363-0042 Call emergency number 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Linde sales representative.
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### SECTION 2: Hazard identification






#### 2.1. Classification of the substance or mixture

##### GHS-CA classification

Gases under pressure : Liquefied gas	H280
Acute toxicity (inhalation:gas) Category 2	H330
Skin corrosion/irritation, Category 1A	H314
Serious eye damage/eye irritation, Category 1	H318
Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation	H335
Specific target organ toxicity — Repeated exposure, Category 2	H373

#### 2.2. GHS Label elements, including precautionary statements

##### GHS-CA labelling

Hazard pictograms	:     
Signal word	: DANGER
Hazard statements	: CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED CAUSES SEVERE SKIN BURNS AND EYE DAMAGE CAUSES SERIOUS EYE DAMAGE FATAL IF INHALED MAY CAUSE DAMAGE TO ORGANS (KIDNEYS) (Inhalation) SYMPTOMS MAY BE DELAYED CORROSIVE TO THE RESPIRATORY TRACT (This statement supercedes H335)
Precautionary statements	: Do not handle until all safety precautions have been read and understood Do not breathe gas

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Do not get in eyes, on skin, or on clothing.  
Use and store only outdoors or in a well-ventilated area.  
Wear protective gloves, protective clothing, eye protection, respiratory protection, and/or face protection.  
Store locked up  
Dispose of contents/container in accordance with container Supplier/owner instructions  
Protect from sunlight when ambient temperature exceeds 52°C (125°F).  
Use a back flow preventive device in the piping.  
Close valve after each use and when empty.  
Do not open valve until connected to equipment prepared for use.  
When returning cylinder, install leak tight valve outlet cap or plug.  
Use only with equipment of compatible materials of construction and rated for cylinder pressure.

### 2.3. Other hazards

No additional information available

### 2.4. Unknown acute toxicity (GHS CA)

Not applicable

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Name	CAS No.	% (Vol.)	Common Name (synonyms)
Boron trifluoride (Main constituent)	(CAS No) 7637-07-2	100	Borane, trifluoro- / Boron fluoride / Trifluoroborane / Boron trifluoride, adsorbed

### 3.2. Mixtures

Not applicable

## SECTION 4: First-aid measures

### 4.1. Description of first aid measures

First-aid measures after inhalation	: Immediately remove to fresh air. If not breathing, give artificial respiration. WARNING: To avoid possible chemical burns, the rescuer should avoid breathing any exhaled air from the victim. Qualified personnel should give oxygen at half-hour intervals for 3-4 hours. Call a physician immediately.
First-aid measures after skin contact	: In case of contact, immediately flush affected areas with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before reuse. Discard contaminated shoes.
First-aid measures after eye contact	: Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.
First-aid measures after ingestion	: Ingestion is not considered a potential route of exposure.

### 4.2. Most important symptoms and effects (acute and delayed)

Symptoms/injuries	: No additional information available
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### 4.3. Immediate medical attention and special treatment, if necessary

No additional information available

## SECTION 5: Fire-fighting measures

### 5.1. Suitable extinguishing media

Suitable extinguishing media	: Use extinguishing media appropriate for surrounding fire.
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### 5.2. Unsuitable extinguishing media

Unsuitable extinguishing media	: Reacts with water.
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### 5.3. Specific hazards arising from the hazardous product

Reactivity	: No reactivity hazard other than the effects described in sub-sections below.
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Reactivity in case of fire : No reactivity hazard other than the effects described in sub-sections below.

### 5.4. Special protective equipment and precautions for fire-fighters

- Firefighting instructions : Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with their provincial and local fire code regulations.
- Protection during firefighting : **DANGER! Toxic, corrosive, high-pressure gas..**
- Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
- Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.
- Other information : If leaking do not spray water (reacts violently).
- Containers are equipped with a pressure relief device. (Exceptions may exist where authorized.).

## SECTION 6: Accidental release measures

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

- General measures : **DANGER: Toxic. Corrosive.** Wear a self-contained breathing apparatus and appropriate personal protective equipment (PPE). (gas tight, chemical-protective) Evacuate personnel to a safe area. Approach suspected leak area with caution. Remove all sources of ignition. Toxic, corrosive vapor can spread from spill. Ventilate area or move container to a well-ventilated area. Before entering the area, especially a confined area, check the atmosphere with an appropriate device. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

### 6.2. Methods and materials for containment and cleaning up

- For containment : Prevent runoff from contaminating the surrounding environment.
- Methods for cleaning up : This material is a Toxic Gas. Any leaks should be handled by Emergency Response personnel. For assistance call your supplier.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

- Precautions for safe handling : Do not breathe gas/vapour. Avoid all contact with skin, eyes, or clothing. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g. wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.



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

Storage conditions : Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 52 °C (125 °F). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods.

**OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE:** When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Boron trifluoride (7637-07-2)		
USA - ACGIH	ACGIH OEL TWA [ppm]	0.1 ppm
USA - ACGIH	ACGIH OEL C [ppm]	0.7 ppm
USA - OSHA	OSHA PEL C	3 mg/m <sup>3</sup>
USA - OSHA	OSHA PEL (Ceiling) (ppm)	1 ppm
Canada (Quebec)	Plafond (OEL C)	2.8 mg/m <sup>3</sup>
Canada (Quebec)	Plafond (OEL C) [ppm]	1 ppm
Alberta	OEL C	2.8 mg/m <sup>3</sup>
Alberta	OEL C [ppm]	1 ppm
British Columbia	OEL C [ppm]	1 ppm
Manitoba	OEL C [ppm]	0.7 ppm
Manitoba	OEL TWA [ppm]	0.1 ppm
New Brunswick	OEL C	2.8 mg/m <sup>3</sup>
New Brunswick	OEL C [ppm]	1 ppm
New Foundland & Labrador	OEL C [ppm]	0.7 ppm
New Foundland & Labrador	OEL TWA [ppm]	0.1 ppm
Nova Scotia	OEL C [ppm]	0.7 ppm
Nova Scotia	OEL TWA [ppm]	0.1 ppm
Nunavut	OEL C [ppm]	1 ppm
Northwest Territories	OEL C [ppm]	1 ppm
Ontario	OEL C [ppm]	1 ppm
Prince Edward Island	OEL C [ppm]	0.7 ppm
Prince Edward Island	OEL TWA [ppm]	0.1 ppm
Québec	Plafond (OEL C)	2.8 mg/m <sup>3</sup>
Québec	Plafond (OEL C) [ppm]	1 ppm
Saskatchewan	OEL C [ppm]	1 ppm
Yukon	OEL C	3 mg/m <sup>3</sup>
Yukon	OEL C [ppm]	1 ppm

### 8.2. Appropriate engineering controls

Appropriate engineering controls : Use corrosion-proof equipment. USE ONLY IN A CLOSED SYSTEM. An explosion-proof, corrosion-resistant, forced-draft fume hood is preferred.

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### 8.3. Individual protection measures/Personal protective equipment

Personal protective equipment : Safety glasses. Face shield. Gloves.



Hand protection : Wear work gloves when handling containers. Wear heavy rubber gloves where contact with product may occur.

Eye protection : Wear safety glasses with side shields. Wear goggles and a face shield when transfilling or breaking transfer connections. Provide readily accessible eye wash stations and safety showers. Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

Respiratory protection : **Respiratory protection:** Use air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below OEL (if applicable). Select in accordance with provincial regulations, local bylaws or guidelines. Respirators should also be approved by NIOSH and MSHA. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Other information : **Other protection :** Safety shoes for general handling at customer sites. Metatarsal shoes and cuffless trousers for cylinder handling at packaging and filling plants. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines. For working with flammable and oxidizing materials, consider the use of flame resistant anti-static safety clothing.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

(a) Physical state	: Gas
(b) Colour	: Colourless. Gives off white fumes in moist air.
(c) Odour	: Pungent.
Odour threshold	: Odour threshold is subjective and inadequate to warn of overexposure.
(d) Melting point	: -127.1 °C (-196.78°F)
Freezing point	: No data available
(e) Boiling point	: -99.8 °C (-147.64°F)
(f) Flammability	: Non flammable
(g) Flammability (solid, gas)	:
(h) Flash point	: Not applicable.
(i) Auto-ignition temperature	: Not applicable.
(j) Decomposition temperature	: No data available
(k) pH	: Not applicable.
(l) Viscosity, kinematic	: Not applicable.
(m) Solubility	: Water: 3280000 mg/l Completely soluble.
(n) Partition coefficient – n-octanol/water [log Pow/log Kow]	: Not applicable.
(o) Vapour pressure	: No data available
(p) Density	: 2.84 kg/m <sup>3</sup> (at 15 °C)
Relative gas density	: 2.4
(r) Particle characteristics	: No data available
(s) Molecular mass	: 68 g/mol
(t) Critical temperature	: -12.2 °C (10.04°F)
(u) Critical pressure	: 4980 kPa
(v) Oxidizing properties	: None.
(w) Relative evaporation rate (butylacetate=1)	: No data available
Relative evaporation rate (ether=1)	: Not applicable.

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### 9.2. Other information

Gas group : Liquefied gas  
Additional information : Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

## SECTION 10: Stability and reactivity

Reactivity : No reactivity hazard other than the effects described in sub-sections below.  
Chemical stability : Stable under normal conditions.  
Possibility of hazardous reactions : May occur. REACTS VIOLENTLY WITH WATER. Reaction with moisture in the atmosphere forms a fuming, white cloud that thickens with increased humidity.  
Conditions to avoid : Water, humidity. Moisture.  
Incompatible materials : Water. Rubber. Plastics. Organic materials. Alkali metals. Alkaline earth metals. (except magnesium). Calcium oxide. Silver.  
Hazardous decomposition products : Thermal decomposition may produce : Boron (B). Fluorine. Reacts with water to form toxic and corrosive vapours. Boron trifluoride. Fluorides.

## SECTION 11: Toxicological information

**11.1 Likely routes of exposure** : Inhalation

**11.2 Symptoms related to the physical, chemical, and toxicological characteristics** : No additional information available

### **11.3 Delayed and immediate effects and chronic effects**

Acute toxicity (oral) : Not classified  
Acute toxicity (dermal) : Not classified  
Acute toxicity (inhalation) : FATAL IF INHALED.  
Skin corrosion/irritation : CAUSES SEVERE SKIN BURNS.  
pH: Not applicable.  
Serious eye damage/irritation : CAUSES SERIOUS EYE DAMAGE.  
pH: Not applicable.  
Respiratory or skin sensitization : Not classified  
Germ cell mutagenicity : Not classified  
Carcinogenicity : Not classified  
Reproductive toxicity : Not classified  
Specific target organ toxicity (single exposure) : MAY CAUSE RESPIRATORY IRRITATION.  
Specific target organ toxicity (repeated exposure) : MAY CAUSE DAMAGE TO ORGANS THROUGH PROLONGED OR REPEATED EXPOSURE.  
Aspiration hazard : Not classified

### **11.4 Toxicity**

Boron trifluoride ( l f )7637-07-2	
LC50 inhalation rat (ppm)	806 ppm/1h
ATE CA (Gases)	403 ppmv/4h

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### SECTION 12: Ecological information

#### 12.1. Toxicity

Ecology - general : No known ecological damage caused by this product.

#### Boron trifluoride (7637-07-2)

EC50 - Crustacea [1]	21.3 mg/l (Exposure time: 48 h - Species: Daphnia magna)
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#### 12.2. Persistence and degradability

#### Boron trifluoride (7637-07-2)

Persistence and degradability	Hydrolyses. Not applicable for inorganic gases.
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#### 12.3. Bioaccumulative potential

#### Boron trifluoride (7637-07-2)

Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No data available.

#### 12.4. Mobility in soil

#### Boron trifluoride (7637-07-2)

Mobility in soil	No data available.
Log Pow	Not applicable.
Log Kow	Not applicable.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

#### 12.5. Other adverse effects

Other adverse effects : May cause pH changes in aqueous ecological systems.  
Effect on the ozone layer : None.  
Effect on global warming : No known effects from this product.

### SECTION 13: Disposal considerations

Product/Packaging disposal recommendations : Do not attempt to dispose of residual or unused quantities. Return container to supplier.

### SECTION 14: Transport information

#### 14.1. Basic shipping description

In accordance with TDG

#### TDG

UN-No. (TDG) : UN1008  
TDG Primary Hazard Classes : 2.3 - Class 2.3 - Toxic Gases  
TDG Subsidiary Classes : 8  
Proper shipping name : BORON TRIFLUORIDE

ERAP Index : 50  
Explosive Limit and Limited Quantity Index : 0  
Passenger Carrying Ship Index : Forbidden  
Passenger Carrying Road Vehicle or Passenger : Forbidden  
Carrying Railway Vehicle Index

#### 14.2. Air and sea transport

#### IMDG

UN-No. (IMDG) : 1008  
Proper Shipping Name (IMDG) : BORON TRIFLUORIDE  
Class (IMDG) : 2 - Gases

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Version: 1.1

MFAG-No : 125

### IATA

UN-No. (IATA) : 1008  
Proper Shipping Name (IATA) : Boron trifluoride  
Class (IATA) : 2 - Gases

## SECTION 15: Regulatory information

### 15.1. National regulations

#### Boron trifluoride (7637-07-2)

Listed on the Canadian DSL (Domestic Substances List)

### 15.2. International regulations

#### Boron trifluoride (7637-07-2)

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Japanese ISHL (Industrial Safety and Health Law)  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
Listed on the United States TSCA (Toxic Substances Control Act) inventory  
Japanese Poisonous and Deleterious Substances Control Law  
Japanese Pollutant Release and Transfer Register Law (PRTR Law)  
Listed on INSQ (Mexican National Inventory of Chemical Substances)

## SECTION 16: Other information

Date of issue : 15/10/1979  
Revision date : 28/07/2023  
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### Indication of changes:

Training advice : Users of breathing apparatus must be trained. Ensure operators understand the toxicity hazard.  
Other information : Prior to using any plastics, confirm their compatibility with this chemical.

When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product.

Linde Canada asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Linde Canada Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Linde Canada Inc, it is the user's obligation to determine the conditions of safe use of the product. Linde Canada Inc, SDSs are furnished on sale or delivery by Linde Canada Inc, or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Linde sales representative, local distributor, or supplier, or download from [www.lindecana.ca](http://www.lindecana.ca).





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### NFPA health hazard

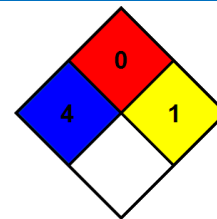
: 4 - Very short exposure could cause death or serious residual injury even though prompt medical attention was given.

### NFPA fire hazard

: 0 - Materials that will not burn.

### NFPA instability

: 1 - Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.



### HMIS III Rating

#### Health

: 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

#### Flammability

: 0 Minimal Hazard - Materials that will not burn

#### Physical

: 3 Serious Hazard - Materials that may form explosive mixtures with water and are capable of detonation or explosive reaction in the presence of a strong initiating source. Materials may polymerize, decompose, self-react, or undergo other chemical change at normal temperature and pressure with moderate risk of explosion

### SDS Canada (GHS) - Linde NEW

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*