



## Safety Data Sheet FOR Boron Trifluoride

In an emergency, call CHEMTREC® at 800-424-9300 or collect 703-527-3887.

### SECTION 1 Identification of the substance/mixture and of the company/undertaking

#### Product identification used on label

**Product identifier** Boron Trifluoride MSDS ID : B020 (Part Nbr: B020)

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

Air Liquide Advanced Materials  
Post Office Box 5357  
North Branch, New Jersey 08876-5357 USA  
Voice: 908-231-9060 or 800-865-8249; Facsimile: 908-231-9063

#### Emergency telephone number

800-424-9300 or call collect 703-527-3887.

#### Other means of identification:

Trifluoroborane, boron fluoride

### SECTION 2 Hazards identification

Classification of the chemical in accordance with paragraph (d) of §1910.1200;

#### GHS Hazard Symbols



#### GHS Classification

Gases under pressure - Liquefied Gas  
Skin Corrosion/Irritation Category 1A  
Serious Eye Damage/Eye Irritation Category 1  
Acute Toxicity - Inhalation Gas Category 2  
Specific Target Organ Systemic Toxicity (STOT) - Repeated Exposure Category 2  
Acute Toxicity - Oral Category 4

#### Signal Word

Danger

#### Hazard Statements

Contains gas under pressure; may explode if heated.  
Harmful if swallowed.  
Causes severe skin burns and eye damage.  
Causes serious eye damage.  
Fatal if inhaled.  
May cause damage to organs through prolonged or repeated exposure.

#### Precautionary Statements

Do not breathe dust/fume/gas/mist/vapours/spray.  
Wash thoroughly after handling.  
Do not eat, drink or smoke when using this product.  
Use only outdoors or in a well-ventilated area.  
Wear protective gloves/protective clothing/eye protection/face protection.  
Wear respiratory protection.

#### Response

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.  
IF SWALLOWED: rinse mouth. Do NOT induce vomiting.  
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.  
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Con  
Immediately call a POISON CENTER/doctor/....  
Get medical advice/attention if you feel unwell.



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	Specific treatment is urgent (see ... on this label).
	Specific treatment (see ... on this label).
	Rinse mouth.
	Wash contaminated clothing before reuse.
<b>Storage</b>	Store in a well-ventilated place. Keep container tightly closed.
	Store locked up.
	Protect from sunlight. Store in a well-ventilated place.
<b>Disposal</b>	Dispose of contents/container in accordance with local/regional/national/international regulation for hazardous waste
<b>Acute Toxicity</b>	100 % of the mixture consists of ingredient(s) of unknown toxicity
<b>Dermal Contains</b>	

### SECTION 3 Composition/information on ingredients

Chemical Name	CAS #	%
Boron Trifluoride	7637-07-2	~ 100

### SECTION 4 First aid measures

<b>Inhalation</b>	This is the primary route of exposure. Remove the affected person from the gas source or contaminated area. Note: Personal Protective Equipment (PPE), including positive pressure, self contained breathing apparatus, may be required to assure the safety of the rescuer. If the affected person is not breathing spontaneously, administer rescue breathing. If the victim has stopped breathing check the pulse. If the heart stops, administer CPR. If medical oxygen and appropriately trained personnel are available, administer 100% oxygen to the affected person. Give the victim six (6) calcium gluconate tablets with water, if conscious. Follow up immediately with medical attention at a medical facility at which the treatment protocol for HF inhalation is to be followed. Summon an emergency ambulance. If an ambulance is not available, contact a physician, hospital, or poison control center for instruction. Keep the affected person warm, comfortable, and at rest while awaiting professional medical care. Monitor breathing and pulse continuously. If the affected person does not have a pulse, administer CPR.
<b>Eyes</b>	Flush continuously with clean water until the professional medical assistance arrives, but for no less than thirty minutes. Continuation of flushing until patient is transferred to an ophthalmologist or emergency physician is recommended.
<b>Skin Contact</b>	Remove contaminated clothing and continue flushing with water. In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Apply calcium gluconate gel to the affected area. Assume the patient has also been exposed by inhalation and obtain professional medical assistance immediately. The effects of skin exposure may be delayed.
<b>Ingestion</b>	Ingestion is not an observed route of exposure to gaseous hazardous materials.
<b>Note to Doctor</b>	The reaction products of boron trifluoride and moist air or water are fluoboric and boric acids. Therefore, skin and eye burns should be treated as exposures to acidic fluorine compounds, e.g., hydrofluoric acid. Consider the use of such agents as benzalkonium chloride, magnesium sulfate, and calcium gluconate. Keep under medical observation for 72 hours for delayed onset of pulmonary edema.

### SECTION 5 Firefighting measures

<b>Flammability Summary</b>	Nonflammable Gas
<b>Extinguishing media</b>	Not combustible. Use extinguishing media appropriate for surrounding fire.
<b>Fire and/or Explosion Hazards</b>	Material will not ignite or burn.
<b>Fire Fighting Methods and Protection</b>	Will not burn, no special instructions available. Use methods appropriate for surrounding materials. Cool the container or cylinder, and surroundings with water



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from a suitable distance.

Excessive pressure may develop in containers or cylinders exposed to fire, which may result in explosion, regardless of the its content.

Containers or cylinders with pressure relief devices (PRD's) may release their contents through such devices if the container or cylinder is exposed to fire.

Containers or cylinders without PRD's have no provision for controlled release and are therefore more likely to explode if exposed to fire.

Note: If boron trifluoride is released, the water used for fire suppression and cooling may be contaminated with fluorine compounds.

The discharge of such compounds to the sewer system or the environment may be may be restricted, requiring the containment and proper disposal of the water.

Positive pressure, self contained breathing apparatus is required for all fire fighting involving hazardous materials.

Full structural firefighting (bunker) gear is the minimum acceptable attire.

The need for proximity, entry, and flashover protection and special protective clothing should be determined for each incident by a competent firefighting safety professional.

Not applicable, this material is a nonflammable gas.

### Hazardous Combustion Products

#### SECTION 6 Accidental release measures

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

Exposure to the spilled material may be severely irritating or toxic. Follow personal protective equipment recommendations found in Section VIII of this MSDS. Personal protective equipment needs must be evaluated based on information provided on this sheet and the special circumstances created by the spill including; the material spilled, the quantity of the spill, the area in which the spill occurred, and the expertise of employees in the area responding to the spill. Never exceed any occupational exposure limits. This material is a gas at atmospheric conditions.

The only means of containment is the enclosure of the space into which the material is released.

Such containment is described in Section 7.

Prevent the spread of any spill to minimize harm to human health and the environment if safe to do so. Wear complete and proper personal protective equipment following the recommendation of Section VIII at a minimum. Dike with suitable absorbent material like granulated clay. Gather and store in a sealed container pending a waste disposal evaluation. Clean up consists of passing the entire gas volume of the enclosure through appropriate exhaust gas treatment equipment (EGTE). Purge the enclosure with a non-reactive gas, such as nitrogen, through the EGTE until an acceptably low level of contamination remains. Equipment contaminated by this material must then be cleaned or decommissioned appropriately. If the release is not contained in an appropriate device or system, all personnel not appropriately protected (see Section 8) must evacuate the contaminated spaces.

Consider evacuation of additional areas, as a precaution against the spread of the release.

#### SECTION 7 Handling and storage

##### Precautions for safe handling

Toxic or severely irritating material. Avoid contacting and avoid breathing the material. Use only in a well ventilated area. Handle this material only in sealed, purged systems. The design of handling systems for hazardous materials is beyond the scope of this SDS, and should be performed by a competent, experienced professional. Consider the use of double-contained piping; diaphragm or bellows sealed, soft seat valves; backflow



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prevention devices; flash arrestors; and flow monitoring or limiting devices. Gas cabinets, with appropriate exhaust treatment, are recommended, as is automatic monitoring of the secondary enclosures and work areas for release.

Handle sealed gas cylinders in accordance with CGA P-1, Safe Handling of Compressed Gasses in Containers.

Some material may have accumulated behind the outlet plug. Face the outlet away from you and wear appropriate protective equipment when removing the plug to connect the container to your system.

Never introduce any substance into a gas container. If you believe your container may have been contaminated, notify Air Liquide immediately. Provide as much information as possible on the nature and quantity of contamination.

### Conditions for safe storage, including any incompatibilities

Store containers in accordance with CGA P-1, Safe Handling of Compressed Gases in Cylinders, local building and fire codes, and other relevant regulations. Materials should be segregated by the hazards they comprise for storage.

Protect the containers from direct sunlight, precipitations, mechanical damage, and temperatures above 52°C (125°F).

### Incompatible materials

Ship and store containers with the outlet plug and valve protective cap in place. Water, Alkali metals, Alkaline earth metals (except magnesium), Alkyl nitrates, Polymerizable materials

## SECTION 8 Exposure controls/personal protection

### Control parameters

<u>Chemical Name</u>	<u>ACGIH TLV</u>	<u>ACGIH STEL</u>	<u>OSHA PEL</u>
Boron Trifluoride	1 ppm	No STEL	1 ppm

### Engineering Measures

Local exhaust is required. Secondary containment, with appropriate exhaust gas treatment, is strongly encouraged and required in some jurisdictions.

Monitor the work area and the secondary containment for release of the material. Automatic alerting of personnel and automatic shutdown of flow are appropriate in most applications and are required in some jurisdictions.

### Respiratory Protection

Purge all primary containment systems with a nonreactive gas, such as nitrogen, before introducing this material.

Respiratory protection must be used when handling this product. Use respirators only if ventilation cannot be used to eliminate symptoms or reduce the exposure to below acceptable levels. A supplied air type respirator may be required. Positive pressure, full face, air supplied breathing apparatus should be used for work within the secondary containment equipment if a leak is suspected or the primary containment is to be opened, e.g., for a cylinder change. Air supplied breathing apparatus is required for response to demonstrated or suspected releases from the primary containment.

### Eye Protection

Wear chemical splash goggles when handling this product. Additionally, wear a face shield when the possibility of splashing of liquid exists. Do not wear contact lenses. Have an eye wash station available. When using respiratory protection as described above, use a face mask that provides splash and impact



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### Skin Protection

protection for the face and eyes. For handling sealed containers, wear safety glasses. Avoid skin contact by wearing chemically resistant gloves, an apron and other protective equipment depending upon conditions of use. Inspect gloves for chemical break-through and replace at regular intervals. Clean protective equipment regularly. Wash hands and other exposed areas with mild soap and water before eating, drinking, and when leaving work. Wear appropriate gloves when handling sealed cylinders. Use gloves and other skin protection, as assigned by a competent safety professional, when working within the secondary enclosure with the primary enclosure compromised, e.g., container changing, to protect from exposure to the material and from fire that may result from its release to the air. For response to demonstrated or suspected releases from the primary containment, the need for whole-body exposure protection should be determined by a competent safety professional. Wear appropriate protective footwear when moving containers or cylinders. Select per OSHA 29CFR1901.132 and 1910.133.

### Gloves

Wear appropriate gloves when handling sealed cylinders.

## SECTION 9 Physical and chemical properties

Physical State	Gas
Color	Colorless
Odor	Strong Pungent
Odor Threshold	No Data Available
pH	ND
Melting Point	-128 °C
Boiling Point	-100 °C
Evaporation Rate	No Data Available
Lower Flammable/Explosive Limit, % in air	No Data Available
Upper Flammable/Explosive Limit, % in air	No Data Available
Vapor Pressure	50 bar at 20°C
Vapor Density	2.867 g/L
Specific Gravity	1.57
Autoignition Temperature	Not determined
Solubility in Water	Not determined, reacts with water
Octanol/Water Partition Coefficient	No Data Available
Viscosity	No Data Available
Volatiles, % by weight	0
Bulk Density	13.11
Molecular Formula	BF <sub>3</sub>
Molecular Weight	67.81 g/mol

## SECTION 10 Stability and reactivity

Reactivity	No Data Available
Chemical stability	Stable under normal conditions. Boron trifluoride is not known to decompose thermally.
Possibility of hazardous reactions	Water, Alkali metals, Alkaline earth metals (except magnesium), Alkyl nitrates, Polymerizable materials
Conditions to avoid	None known. Exposure to air, Contact with water
Incompatible materials	Water, Alkali metals, Alkaline earth metals (except magnesium), Alkyl nitrates, Polymerizable materials
Hazardous decomposition products	Reaction with water produces fluoboric acid and boric acid

## SECTION 11 Toxicological information



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**Routes of Entry** Inhalation, Skin, eye, mucous membrane contact  
**Target Organs Potentially Affected by Exposure** Bone, Dental erosion, Blood, Lungs  
**Chemical Interactions that Change Toxicity** No chemical interaction known to affect toxicity.  
**Medical Conditions Aggravated by Exposure** No data found

### Immediate (Acute) Health Effects by Route of Exposure

**Inhalation Irritation** Can be corrosive to the respiratory tract causing severe irritation and tissue damage. Corrosive. May be fatal if inhaled.  
**Inhalation Toxicity** Toxic! Can cause systemic damage (see "Target Organs"). Respiratory failure is possible at high doses.  
**Skin Contact** Corrosive to skin tissue. Can cause chemical burns.  
**Skin Absorption** Toxic if absorbed through the skin. Likely to cause significant systemic damage.  
**Eye Contact** Corrosive to eye tissue. Can cause severe irritation, tearing, and burns that can quickly lead to permanent injury including blindness.  
**Ingestion Irritation** Corrosive to tissue. Can cause severe and permanent damage to mouth, throat, stomach. Aspiration may lead to lung damage.  
**Ingestion Toxicity** Ingestion is not an observed route of exposure to gaseous hazardous materials.

### Long-Term (Chronic) Health Effects

**Carcinogenicity** None of the substances have been shown to cause cancer in long term animal studies. Not a carcinogen according to NTP, IARC, or OSHA.  
**Reproductive and Developmental Toxicity** No data available to indicate product or any components present at greater than 0.1% may cause birth defects.  
**Mutagenicity** No data available to indicate product or any components present at greater than 0.1% is mutagenic or genotoxic.  
**Inhalation** Upon prolonged and/or repeated exposure, can be corrosive to the respiratory tract causing severe irritation and tissue damage. Toxic! Can cause systemic damage upon prolonged and/or repeated exposure (see "Target Organs").  
**Skin Contact** Upon prolonged or repeated contact, corrosive to skin tissue. Can cause chemical burns.  
**Skin Absorption** Upon prolonged or repeated exposure, toxic if absorbed through the skin. Likely to cause systemic damage.

### Component Toxicology Data (NIOSH):

Chemical Name	CAS Number	Inhalation (LC50 ppm - rat)	Ingestion (LD 50 mg/kg - rat)	Absorption
Boron Trifluoride	7637-07-2	Inhalation LC50 (4h) Rat 420 ppm	Inhalation LC50 (4h) Rat 420 ppm	

### SECTION 12 Ecological information

**Overview** This material is not expected to be harmful to the ecology.  
**Mobility** No data  
**Persistence** Hydrolyzes to fluoboric and boric acids.  
**Bioaccumulation** No data  
**Ecological Toxicity Data** No data

### SECTION 13 Disposal considerations

**Waste Description for Spent Product** Spent or discarded material is a hazardous waste. This material meets the criteria for an "acute hazardous waste".  
**Disposal Methods** Dispose of by incineration following Federal, State, Local, or Provincial regulations.  
**Waste Disposal Code(s)** If discarded, this product is considered a RCRA corrosive waste, D002., If discarded,





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this product is considered a RCRA toxic waste.

### SECTION 14 Transport information

UN number	UN1008
UN proper shipping name	BORON TRIFLUORIDE
Technical Name	Not applicable
Transport hazard class(es)	2.3, 8
Environmental hazards	Not a marine pollutant.
Toxic By Inhalation Zone:	B
Via cargo aircraft shipments, IATA requirements:	Forbidden
Via passenger aircraft shipments, IATA requirements:	Forbidden
Via Air, IATA emergency response guide nbr:	2CP
North American Emergency Response Guide Nbr:	125
Via water, IMDG code:	2107
Via water, IMO Emergency Response Procedures (EmS Guide):	750
Via water, IMO Medical First Aid Guide (MFAG):	F-C, S-U

#### Domestic Transportation Labels



#### International Transportation Labels



#### Other Transportation Labels

No "Cargo only" label required. Not a marine pollutant.

### SECTION 15 Regulatory information

TSCA Status All components in this product are on the TSCA Inventory.

Chemical Name	CAS #	Regulation	% Range
No 313-listed chemicals in this product		SARA 313	
Boron Trifluoride	7637-07-2	SARA EHS	~ 100

### SECTION 16 Other information

Revision 09-22-2015

Date

Disclaimer IMPORTANT: WHILE THE DESCRIPTIONS, DATA AND INFORMATION CONTAINED HEREIN ARE



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