

Material Name: Boron Trifluoride

	* * *Section 1 - IDENTIFICATION* * *
CUC product identifier	
GHS product identifier Chemical name	Boron Trifluoride
Other means of	boron trifluoride
identification	Boron trifluoride; Boron fluoride (BF3); Boron fluoride; Trifluoroborane; Trifluoroboron; BF3; Fluorure de bore; UN 1008; Leecure b series
Product use	Synthetic/Analytical chemistry.
Synonym	Boron trifluoride; Boron fluoride (BF3); Boron fluoride; Trifluoroborane; Trifluoroboron; BF3; Fluorure de bore; UN 1008; Leecure b series
Supplier's details	Electronic Fluorocarbons 3266 Bergey Road Hatfield PA 19440
Emergency telephone # Outside the US (call collect)	1-800-535-5053 1-352-323-3500
	* * *Section 2 - HAZARDS IDENTIFICATION* * *
OSHA/HCS status	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	GASES UNDER PRESSURE - Compressed gas ACUTE TOXICITY (inhalation) - Category 2 SKIN CORROSION/IRRITATION - Category 1 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (kidneys) - Category 2
GHS label elements	
Hazard pictograms	
Signal word	Danger
Hazard statements	Contains gas under pressure; may explode if heated. Fatal if inhaled. Causes severe skin burns and eye damage. Causes serious eye damage. May cause damage to organs through prolonged or repeated exposure. (kidneys)
Precautionary statements	
General	Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction.

Prevention	Wear protective gloves. Wear eye or face protection. Wear respiratory protection. Use only outdoors or in a well-ventilated area. Do not breathe gas. Wash hands thoroughly after handling. Use and store only outdoors or in a well ventilated place.
Response	Get medical attention if you feel unwell. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.
Storage	Store locked up. Protect from sunlight. Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.
Disposal	Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazards not otherwise classified	In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.
* * *Section	on 3 - COMPOSITION / INFORMATION ON INGREDIENTS* * *
Substance/mixture	Substance
Chemical name	boron trifluoride

CAS number/other identifiers

CAS number	7637-07-2		
Product code	001006		
Ingredient name		%	CAS number
boron trifluoride		100	7637-07-2

Other means of identification Boron trifluoride; Boron fluoride (BF3); Boron fluoride; Trifluoroborane; Trifluoroboron; BF3; Fluorure de bore; UN 1008; Leecure b series

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

* * *Section 4 - FIRST AID MEASURES* * *

Description of necessary first aid measures

Eye contact	Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.
Inhalation	Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact	Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Ingestion	As this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects	
Eye contact	 Causes serious eye damage. Contact with rapidly expanding gas may cause burns or frostbite.
Inhalation	Fatal if inhaled. May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.
Skin contact	Causes severe burns. Contact with rapidly expanding gas may cause burns or frostbite.
Frostbite	Try to warm up the frozen tissues and seek medical attention.
Ingestion	May cause burns to mouth, throat and stomach. As this product is a gas, refer to the inhalation section.
Over-exposure signs/sympto	oms
Eye contact	Adverse symptoms may include the following: pain watering redness
Inhalation	No specific data.
Skin contact	Adverse symptoms may include the following: pain or irritation redness blistering may occur
Ingestion	Adverse symptoms may include the following: stomach pains
	cal attention and special treatment needed, if necessary
Notes to physician	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	No specific treatment.
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

* * *Section 5 - FIRE FIGHTING MEASURES* * *

Extinguishing media	
Suitable extinguishing media	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	None known.
Specific hazards arising from the chemical	Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

Hazardous thermal decomposition products	Decomposition products may include the following materials: halogenated compounds
Special protective actions for fire-fighters	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
Special protective equipment for fire-fighters	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not breathe gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions	Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill	Immediately contact emergency personnel.	Stop leak if without risk.
Large spill	Immediately contact emergency personnel.	. Stop leak if without risk. Note: see Section
	1 for emergency contact information and Se	ection 13 for waste disposal.

* * *Section 7 - HANDLING AND STORAGE* * *

Precautions for safe handling

Protective measures	Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Do not get in eyes or on skin or clothing. Do not breathe gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
Advice on general occupational hygiene	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities	Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Store locked up. Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

* * *Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION* * *

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
boron trifluoride	ACGIH TLV (United States, 3/2012). C: 2.8 mg/m ³ C: 1 ppm NIOSH REL (United States, 1/2013). CEIL: 3 mg/m ³ CEIL: 1 ppm OSHA PEL (United States, 6/2010). CEIL: 3 mg/m ³ CEIL: 1 ppm OSHA PEL 1989 (United States, 3/1989). CEIL: 3 mg/m ³ CEIL: 1 ppm

Appropriate engineering controls	Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
Environmental exposure controls	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.
Individual protection measures	
Hygiene measures	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
Eye/face protection	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/ or face shield. If inhalation hazards exist, a full-face respirator may be required instead.
Skin protection	
Hand protection	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
Body protection	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Other skin protection	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory protection	Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

**'*Section - - D\ mg]WU UbX'7 \ Ya]WU DfcdYf]h]Yg* **

<u>Appearance</u> Physical state Color Molecular weight Molecular formula	Gas. [Compressed gas.] Colorless. 67.81 g/mole B-F3
Boiling/condensation point Melting/freezing point Critical temperature	-101°C (-149.8°F) -126°C (-194.8°F) -12.2°C (10°F)
Odor Odor threshold pH Flash point Burning time Burning rate Evaporation rate Flammability (solid, gas) Lower and upper explosive (flammable) limits Vapor pressure Vapor density	Pungent. Not available. Not available. [Product does not sustain combustion.] Not applicable. Not applicable. Not available. Not available. Not available. Q 70°F (21.1°C) above the critical temperature of 9.86°F (-12.3°C)
Specific Volume (ft ³ /lb) Gas Density (lb/ft ³) Relative density Solubility Solubility in water Partition coefficient: n- octanol/water Auto-ignition temperature	 2.4 (Air = 1) 334.4482 0.00299 Not applicable. Not available. Not available. Not available. Not available.
Decomposition temperature SADT Viscosity	Not available. Not available. Not applicable.

* * *Section 10 - STABILITY AND REACTIVITY* * *

Reactivity	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	No specific data.
Incompatibility with various substances	Highly reactive or incompatible with the following materials: metals, alkalis and moisture.

Hazardous decomposition
productsUnder normal conditions of storage and use, hazardous decomposition products should
not be produced.

Hazardous polymerization	Under normal conditions of storage and use, I	hazardous polymerization will not occur
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* * *Section 11 - TOXICOLOGICAL INFORMATION* * *

Information on toxicological effects

Acute toxicity

Product/ingredient name	Product/ingredient name Result		Dose	Exposure
boron trifluoride	LC50 Inhalation Gas.	Rat	806 ppm	1 hours

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Name	Category	Route of exposure	Target organs
boron trifluoride	Category 2	Not determined	kidneys

Aspiration hazard

Information on the likely

Not available.

routes of exposure	
Potential acute health effects	
Eye contact	Causes serious eye damage. Contact with rapidly expanding gas may cause burns or frostbite.
Inhalation	Fatal if inhaled. May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.
Skin contact	Causes severe burns. Contact with rapidly expanding gas may cause burns or frostbite.
Ingestion	May cause burns to mouth, throat and stomach. As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	Adverse symptoms may include the following: pain watering redness
Inhalation	No specific data.
Skin contact	Adverse symptoms may include the following: pain or irritation redness blistering may occur
Ingestion	Adverse symptoms may include the following: stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure	
Potential immediate effects	Not available.
Potential delayed effects	Not available.
Long term exposure	
Potential immediate effects	Not available.
Potential delayed effects	Not available.
Potential chronic health eff	ects
Not available.	
General	May cause damage to organs through prolonged or repeated exposure
Carcinogenicity	No known significant effects or critical hazards.
Mutagenicity	No known significant effects or critical hazards.
Teratogenicity	No known significant effects or critical hazards.
Developmental effects	No known significant effects or critical hazards.
Fertility effects	No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

* * *Section 12 - ECOLOGICAL INFORMATION* * *

Toxicity

Not available.

Persistence and degradability

Not available.

Bioaccumulative potential

Not available.

Mobility in soil

Soil/water partition Not available. coefficient (Koc)

Other adverse effects

No known significant effects or critical hazards.

* * *Section 13 - DISPOSAL CONSIDERATIONS* * *

Disposal methods

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

* * *Section 14 - Transport Information* * *

	DOT	TDG	Mexico	IMDG	ΙΑΤΑ
UN number	UN1008	UN1008	UN1008	UN1008	UN1008
UN proper shipping name	BORON TRIFLUORIDE	BORON TRIFLUORIDE, COMPRESSED	BORON TRIFLUORIDE	BORON TRIFLUORIDE	BORON TRIFLUORIDE
Transport hazard class(es)	2.3 (8)	2.3 (8)	2.3 (8)	2.3 (8)	2.3 (8)
Packing group	-	-	-	-	-
Environment	No.	No.	No.	No.	No.
Additional information	Inhalation hazard zone B Limited quantity Yes. Packaging instruction Passenger aircraft Quantity limitation: Forbidden. Cargo aircraft Quantity limitation: Forbidden. Special provisions 2, B9, B14	Explosive Limit and Limited Quantity Index 0 ERAP Index 25 Passenger Carrying Ship Index Forbidden Passenger Carrying Road or Rail Index Forbidden	-	-	Passenger and Cargo <u>Aircraft</u> Quantity limitation: 0 Forbidden <u>Cargo Aircraft Only</u> Quantity limitation: 0 Forbidden

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Special precautions for user

Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according
to Annex II of MARPOLNot available.73/78 and the IBC Code

* * *Section 15 - REGULATORY INFORMATION* * *

U.S. Federal regulations TSCA 8(a) CDR Exempt/Partial exemption: Not determined United States inventory (TSCA 8b): This material is listed or exempted.

Clean Air Act (CAA) 112 regulated toxic substances: boron

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)	trifluoride: Not listed
Clean Air Act Section 602 Class I Substances	Not listed
Clean Air Act Section 602 Class II Substances	Not listed
DEA List I Chemicals (Precursor Chemicals)	Not listed
DEA List II Chemicals (Essential Chemicals)	Not listed

SARA 302/304

Composition/information on ingredients

			SARA 302 TPQ		SARA 304 RQ	
Name	%	EHS	(lbs)	(gallons)	(lbs)	(gallons)
boron trifluoride	100	Yes.	500	-	500	-

SARA 304 RQ 500 lbs / 227 kg

SARA 311/312

Classification

Sudden release of pressure Immediate (acute) health hazard Delayed (chronic) health hazard

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
boron trifluoride	100	No.	Yes.	No.	Yes.	Yes.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	boron trifluoride	7637-07-2	100
Supplier notification	boron trifluoride	7637-07-2	100

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts	This material is listed.
New York New	This material is listed.
Jersey	This material is listed.
Pennsylvania	This material is listed.
Canada inventory	This material is listed or exempted.
International regulations	
International lists	 Australia inventory (AICS): This material is listed or exempted. China inventory (IECSC): This material is listed or exempted. Japan inventory: This material is listed or exempted. Korea inventory: This material is listed or exempted. Malaysia Inventory (EHS Register): This material is listed or exempted. New Zealand Inventory of Chemicals (NZIoC): This material is listed or exempted. Philippines inventory (PICCS): This material is listed or exempted. Taiwan inventory (CSNN): Not determined.
Chemical Weapons Convention List Schedule I Chemicals	Not listed
Chemical Weapons Convention List Schedule II Chemicals	Not listed
Chemical Weapons Convention List Schedule III Chemicals	Not listed
Canada	
WHMIS (Canada)	Class A: Compressed gas. Class D-1A: Material causing immediate and serious toxic effects (Very toxic). Class E: Corrosive material CEPA Toxic substances : This material is not listed.
	CEPA Toxic substances: This material is not listed. Canadian ARET: This material is not listed. Canadian NPRI: This material is listed. Alberta Designated Substances: This material is not listed. Ontario Designated Substances: This material is not listed. Quebec Designated Substances: This material is not listed.
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* * *Section 16 - OTHER INFORMATION* * *

Canada Label requirements Class A: Compressed gas. Class D-1A: Material causing immediate and serious toxic effects (Very toxic). Class E: Corrosive material

Hazardous Material Information System (U.S.A.)

NFPA Ratings

Health: 4 Fire: 0 Reactivity: 0 Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA -Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit;

IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LOLI - List Of LIsts™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; RID - European Rail Transport; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

Other Information

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