

Boron Trifluoride**10198495**

Version 3.1

Revision Date 10/05/2023

Print Date 11/01/2023

SECTION 1. IDENTIFICATION

Product name : Boron Trifluoride

Number : 000000000197

Product Use Description : Catalyst, Chemical-technical application

Manufacturer or supplier's details : Honeywell International Inc.
115 Tabor Road
Morris Plains, NJ 07950-2546

For more information call : 800-522-8001
+1-973-455-6300(Monday-Friday, 9:00am-5:00pm)

In case of emergency call : Medical: 1-800-498-5701 or +1-303-389-1414
: Transportation (CHEMTREC): 1-800-424-9300 or +1-703-527-3887
:
: (24 hours/day, 7 days/week)

SECTION 2. HAZARDS IDENTIFICATION**Emergency Overview**

Form : Compressed gas

Color : Clear in an inert atmosphere. Forms a dense white cloud when exposed to moisture.

Odor : Pungent odor with a stinging effect on eyes and skin.

Classification of the substance or mixture

Classification of the substance or mixture : Gases under pressure, Compressed gas
Acute toxicity, Category 2, Inhalation
Skin corrosion, Category 1A
Serious eye damage, Category 1
Specific target organ toxicity - single exposure, Category 3, respiratory tract irritation
Specific target organ toxicity - repeated exposure, Category 2,

Boron Trifluoride**10198495**

Version 3.1

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Print Date 11/01/2023

Kidney
Simple Asphyxiant

GHS Label elements, including precautionary statements

Symbol(s)



Signal word

: Danger

Hazard statements

: Contains gas under pressure; may explode if heated.
Causes severe skin burns and eye damage.
Fatal if inhaled.
May cause respiratory irritation.
May cause damage to organs through prolonged or repeated exposure.
May displace oxygen and cause rapid suffocation.

Precautionary statements

: **Prevention:**
Wash skin thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
Wear respiratory protection.

Response:

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. Continue rinsing.
Immediately call a POISON CENTER/ doctor.
Specific treatment is urgent (see supplemental first aid instructions on this label).
Wash contaminated clothing before reuse.

Storage:

Store in a well-ventilated place. Keep container tightly closed.
Store locked up.

Boron Trifluoride**10198495**

Version 3.1

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Protect from sunlight.

Disposal:

Dispose of contents/ container to an approved waste disposal plant.

Carcinogenicity

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP, IARC, or OSHA.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTSSynonyms : BF₃, Trifluoroborane (NIOSH), Boron FluorideFormula : BF₃

Chemical nature : Substance

Chemical name	CAS-No.	Concentration
Boron trifluoride	7637-07-2	100.00 %

SECTION 4. FIRST AID MEASURES

Inhalation : Move to fresh air. If breathing is irregular or stopped, administer artificial respiration. If breathing is difficult, give oxygen. Use oxygen as required, provided a qualified operator is present. Call a physician immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash contaminated clothing before re-use. Discard contaminated shoes. Call a physician immediately.

Eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Call a physician immediately.

Boron Trifluoride**10198495**

Version 3.1

Revision Date 10/05/2023

Print Date 11/01/2023

Ingestion : Unlikely route of exposure. Do not give anything by mouth. Call a physician immediately.

Notes to physician

Indication of immediate medical attention and special treatment needed, if necessary : Treat as a corrosive acid. Boron Trifluoride breaks down into Boric and Fluoroboric acid (strong corrosive acids). May form fluoride ions under extreme conditions. Consider treatment for fluoride toxicity, hypocalcemia, and hypomagnesemia if exposure is severe.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Fog type spray to knock down fumes and particulates.

Specific hazards during firefighting : Contents under pressure.
This product is not flammable at ambient temperatures and atmospheric pressure.

Special protective equipment for firefighters : Wear self-contained breathing apparatus and protective suit.

Further information : Use water spray to cool fire exposed tanks and containers.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Immediately evacuate personnel to safe areas.
Keep people away from and upwind of spill/leak.
Wear personal protective equipment.
Ventilate the area.
Unprotected personnel should not return until air has been tested and determined safe.
Do not swallow.
Do not breathe vapours, mist or gas.
Do not get in eyes, on skin, or on clothing.

Environmental precautions : Prevent further leakage or spillage if safe to do so.
Do not flush into surface water or sanitary sewer system.
Retain and dispose of contaminated wash water.

Boron Trifluoride**10198495**

Version 3.1

Revision Date 10/05/2023

Print Date 11/01/2023

Do not allow run-off from fire fighting to enter drains or water courses.

Methods and materials for containment and cleaning up

: In case of leakage from BF₃ cylinders, copious water sprays may be used or the cylinder may be inverted into a drum of water. Water sprays should be directed to as close to the source as possible but not directly on the leak as this may cause more corrosion. The volume of water will act as a heat sink and control the exothermic reaction while providing a large excess of water for absorbing the BF₃. It is also advisable to place a water hose in the drum to maintain a constant flow of water to assist absorption, keep the container cool, and reduce acidity and corrosion by dilution. The contaminated acidic water must be contained for ultimate treatment and disposal in accordance with applicable environmental regulations.

Releases of BF₃ to the atmosphere create a dense, white cloud. Because of the very rapid reaction rate between BF₃ and water, water sprays are very effective in mitigating the cloud. Water sprays should be directed as close to the source of the leak as possible. Because of the acidic nature of BF₃ hydrates and their hydrolysis products, direct contact with the leak source should be avoided as corrosion and enlargement of the leak site may result.

However, if large quantities of water are available, such as from a fire hose with a coarse fog nozzle, the coarse spray can be directed at the source to serve as both a diluent and coolant. As a reminder, all the possible species present – BF₃ hydrate(s), ionized BF₃ hydrate(s), hydroxyfluoborate, and fluoroboric acid – are strong acids and must be directed to a containment or treatment facility to be ultimately disposed of in accordance with applicable environmental regulations. They also contained combined fluoride which could eventually affect human tissue if contacted in any significant quantity.

SECTION 7. HANDLING AND STORAGE**Handling**

Precautions for safe handling : Wear personal protective equipment.
Use only with adequate ventilation.

Boron Trifluoride**10198495**

Version 3.1

Revision Date 10/05/2023

Print Date 11/01/2023

Follow all standard safety precautions for handling and use of compressed gas cylinders.

Do not drop or bang cylinders together. Do not apply heat or chill cylinders below -20°F (-29°C). Do not add other gases to BF₃ cylinder.

Wash thoroughly after handling.

Do not swallow.

Do not breathe vapours or spray mist.

Do not get in eyes, on skin, or on clothing.

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Storage

Conditions for safe storage, including any incompatibilities : Keep containers tightly closed in a dry, cool and well-ventilated place.

Keep away from direct sunlight.

Protect from atmospheric moisture and water.

Protect cylinders from physical damage.

Store away from incompatible substances.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective measures : Ensure that eyewash stations and safety showers are close to the workstation location.

Engineering measures : Use with local exhaust ventilation.

Eye protection : Wear as appropriate:
Goggles or face shield, giving complete protection to eyes

Hand protection : PVC disposable gloves
Neoprene gloves
Gloves must be inspected prior to use.
Replace when worn.

Skin and body protection : Full protective suit

Respiratory protection : For visible releases of BF₃, wear a NIOSH approved full-face supplied air or self-contained breathing apparatus (SCBA).

Boron Trifluoride**10198495**

Version 3.1

Revision Date 10/05/2023

Print Date 11/01/2023

Exposure Guidelines

Components	CAS-No.	Value	Control parameters	Update	Basis
Boron trifluoride	7637-07-2	TWA : Time weighted average	(0.1 ppm)	03 2016	ACGIH:US. ACGIH Threshold Limit Values, as amended
Boron trifluoride	7637-07-2	Ceiling : Ceiling Limit Value:	(0.7 ppm)	03 2016	ACGIH:US. ACGIH Threshold Limit Values, as amended
Boron trifluoride	7637-07-2	Ceil_Tim e : Ceiling Limit Value and Time Period (if specified) :	3 mg/m3 (1 ppm)	2005	NIOSH/GUIDE:US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Boron trifluoride	7637-07-2	Ceiling : Ceiling Limit Value:	3 mg/m3 (1 ppm)	02 2006	OSHA_TRANS:US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000), as amended
Boron trifluoride	7637-07-2	Ceiling : Ceiling Limit Value:	3 mg/m3 (1 ppm)	1989	Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended
Boron trifluoride	7637-07-2	TWA : Time weighted average	2.5 mg/m3	02 2006	OSHA/Z2:US. OSHA Table Z-2 (29 CFR 1910.1000), as amended

Boron Trifluoride**10198495**

Version 3.1

Revision Date 10/05/2023

Print Date 11/01/2023

Further information	:	Form of exposure : Dust.
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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state : Compressed gas

Color : Clear in an inert atmosphere. Forms a dense white cloud when exposed to moisture.

Odor : Pungent odor with a stinging effect on eyes and skin.

pH : Note: not determined

Melting point/range : -128.4 °C

Boiling point/boiling range : -100 °C at 1,013 hPa

Flash point : Note: Not applicable

Lower flammability limit : Note: Not applicable

Upper flammability limit : Note: Not applicable

Vapor pressure : Note: No data available

Vapor density : 2.34 Note: (Air = 1.0)

Water solubility : 77 g/l
Note: hydrolyses

Boron Trifluoride**10198495**

Version 3.1

Revision Date 10/05/2023

Print Date 11/01/2023

Partition coefficient: n-octanol/water : Note: No data available

Ignition temperature : Note: Not applicable

Molecular weight : 67.81 g/mol

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Not classified as a reactivity hazard.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : Hazardous polymerisation does not occur.

Conditions to avoid : Protect from extreme heat and cold.
Keep away from direct sunlight.

Incompatible materials : Polymerizable materials, water, alkali metals, alkaline earth metals except magnesium, alkyl nitrates.

Hazardous decomposition products : Vapor reacts rapidly with water in the air to form BF₃ hydrates. Reaction with excess water forms fluoroboric acid (a strong acid), boric acid and hydroxy fluoroboric acids.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute inhalation toxicity : LC50: 1.21 mg/l , gas
Exposure time: 4 h
Species: Rat, male and female
Method: OECD Test Guideline 403

Skin irritation : Result: Causes severe burns.

Boron Trifluoride**10198495**

Version 3.1

Revision Date 10/05/2023

Print Date 11/01/2023

Classification: Corrosive

Eye irritation : Result: Risk of serious damage to eyes.
Classification: Corrosive

Repeated dose toxicity : Species: Rat, male and female
Application Route: inhalation (gas)
Exposure time: 13 Weeks
NOAEL (No observed adverse effect level): 6 mg/m³
LOAEL (Lowest observed adverse effect level): 17 mg/m³
Target Organs: Kidney

Genotoxicity in vitro : Test Method: Ames test
Result: Not active up to 100% v/v with or without S9.

SECTION 12. ECOLOGICAL INFORMATION**Further information on ecology**

Additional ecological information : We have no quantitative data concerning the ecological effects of this product.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods : Observe all Federal, State, and Local Environmental regulations.

SECTION 14. TRANSPORT INFORMATION

DOT UN/ID No. : UN 1008
Proper shipping name : BORON TRIFLUORIDE
Poison Inhalation Hazard Hazard zone B

Boron Trifluoride**10198495**

Version 3.1

Revision Date 10/05/2023

Print Date 11/01/2023

Class	2.3
Packing group	
Hazard Labels	2.3 (8)

IATA	UN/ID No.	: UN 1008
	Class	: 2.3
	Not permitted for transport	

IMDG	UN/ID No.	: UN 1008
	Description of the goods	: BORON TRIFLUORIDE
	Class	: 2.3
	Hazard Labels	: 2.3 (8)
	EmS Number	: F-C, S-U
	Marine pollutant	: no

SECTION 15. REGULATORY INFORMATION**Inventories**

US. Toxic Substances Control Act : On TSCA Inventory

Australia. Inventory of Industrial Chemicals (AIIC), as amended : On the inventory, or in compliance with the inventory

Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL) : All components of this product are on the Canadian DSL

Japan. Kashin-Hou Law List : On the inventory, or in compliance with the inventory

Korea. Existing Chemicals Inventory (KECI) : On the inventory, or in compliance with the inventory

Philippines. Inventory of Chemicals and Chemical Substances (PICCS) : On the inventory, or in compliance with the inventory

China. Inventory of Existing : On the inventory, or in compliance with the inventory

Boron Trifluoride**10198495**

Version 3.1

Revision Date 10/05/2023

Print Date 11/01/2023

Chemical Substances
(IECSC)

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand : On the inventory, or in compliance with the inventory

Taiwan Chemical Substance Inventory (TCSI) : On the inventory, or in compliance with the inventory

National regulatory information

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A) SARA III : The following component(s) of this product is/are subject to the emergency planning provisions of 40 CFR 355 when there are amounts equal to or greater than the Threshold Planning Quantity (TPQ):

Reportable quantity:: 500 lbs

: Boron trifluoride 7637-07-2

SARA 302 Components : The following components are subject to reporting levels established by SARA Title III, Section 302:

: Boron trifluoride 7637-07-2

SARA 313 Components : The following components are subject to reporting levels established by SARA Title III, Section 313:

: Boron trifluoride 7637-07-2

SARA 311/312 Hazards : Sudden Release of Pressure Hazard
Acute Health Hazard
Chronic Health Hazard

California Prop. 65 : This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Boron Trifluoride**10198495**

Version 3.1

Revision Date 10/05/2023

Print Date 11/01/2023

Massachusetts RTK	:	Boron trifluoride	7637-07-2
New Jersey RTK	:	Boron trifluoride	7637-07-2
Pennsylvania RTK	:	Boron trifluoride	7637-07-2

SECTION 16. OTHER INFORMATION

	HMIS III	NFPA
Health hazard	: 3	4
Flammability	: 0	0
Physical Hazard	: 1	
Instability	:	1

Hazard rating and rating systems (e.g. HMIS® III, NFPA): This information is intended solely for the use of individuals trained in the particular system.

Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. Final determination of suitability of any material is the sole responsibility of the user. This information should not constitute a guarantee for any specific product properties.

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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Prepared by Honeywell Performance Materials and Technologies Product Stewardship Group