

Safety Data Sheet

Boron trifluoride

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878

SDS Reference Number: D-BF3-007

Issue date: 1/7/2016 Revision date: 12/15/2025 Supersedes version of: 1/3/2023 Version: 0.4

Danger



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

1.1. Product identifier

Trade name	:	Boron trifluoride
SDS no	:	D-BF3-007
Other means of identification	:	Boron trifluoride
	CAS-No.	: 7637-07-2
	EC-No.	: 231-569-5
	EC Index-No.	: 005-001-00-X
REACH registration No	:	01-2119534579-27
Chemical formula	:	BF3

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

Relevant identified uses	:	See the list of identified uses and exposure scenarios in the annex of the safety data sheet. Perform risk assessment prior to use.
Uses advised against	:	Consumer use. Uses other than those listed above are not supported, contact your supplier for more information on other uses. Attention: These products must not be applied to humans or animals unless they are expressly designated as medical or medicinal gases!.

1.3. Details of the supplier of the safety data sheet

Messer Industriegase GmbH
Messer- Platz 1
D - 65812 Bad Soden am Taunus
Germany
T +49 (0) 6196 7760-200, F +49 (0) 6196 7760-280
SDB.de@messergroup.com, www.messer.de

1.4. Emergency telephone number

Emergency telephone number	:	Messer Produktionsgesellschaft mbH Salzgitter, +49 (0) 5341 21-9333, erreichbar Montags 0:00 bis Sonntags 24:00
----------------------------	---	---

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

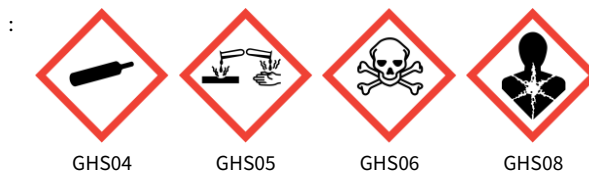
Classification according to Regulation (EC) No. 1272/2008 [CLP]

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

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)



Signal word (CLP)

: Danger

Hazard statements (CLP)

: H314 - Causes severe skin burns and eye damage.
H280 - Contains gas under pressure; may explode if heated.
H330 - Fatal if inhaled.
H373 - May cause damage to organs through prolonged or repeated exposure.
EUH014 - Reacts violently with water.
EUH071 - Corrosive to the respiratory tract.

EUH071 supersedes H335 when assigned in the classification.

Precautionary statements (CLP)

- Prevention : P280 - Wear eye protection, face protection, protective clothing, protective gloves.
P260 - Do not breathe gas, vapours.

- Response : P308+P313 - IF exposed or concerned: Get medical advice/attention.
P303+P361+P353+P315 - IF ON SKIN : (or hair) Take off immediately all contaminated clothing.
Rinse skin with water or shower. Get immediate medical advice.
P304+P340+P315 - IF INHALED : Remove person to fresh air and keep comfortable for breathing.
Get immediate medical advice.
P305+P351+P338+P315 - IF IN EYES : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice.

- Storage : P405 - Store locked up.
P403 - Store in a well-ventilated place.

2.3. Other hazards

Not classified as PBT or vPvB.
The substance/mixture has no endocrine disrupting properties.
Not classified as PMT or vPvM.

Safety Data Sheet

Boron trifluoride

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS Reference Number: D-BF3-007

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP] ATE, EUH-statements, M-Factors
Boron trifluoride	CAS-No.: 7637-07-2 EC-No.: 231-569-5 EC Index-No.: 005-001-00-X REACH registration No: 01-2119534579-27	100	Press. Gas (Liq.), H280 Acute Tox. 2 (Inhalation:gas), H330 (ATE=432 ppmv/4h) Skin Corr. 1A, H314 Eye Dam. 1, H318 STOT SE 3, H335 STOT RE 2, H373

Name	Product identifier	Specific concentration limits (%)
Boron trifluoride	CAS-No.: 7637-07-2 EC-No.: 231-569-5 EC Index-No.: 005-001-00-X REACH registration No: 01-2119534579-27	(1 ≤ C ≤ 100) STOT SE 3; H335

Contains no other components or impurities which will influence the classification of the product.

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

- Inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing stopped.
- Skin contact : In case of skin contact, wearing rubber gloves rub 2.5% calcium gluconate gel continuously into the affected area for 1.5 hours or until further medical care is available.
Remove contaminated clothing. Drench affected area with water for at least 15 minutes.
- Eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.
- Ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

May cause severe chemical burns to skin and cornea. Suitable first-aid treatment should be immediately available. Seek medical advice before using product.

Material is destructive to tissue of the mucuous membranes and upper respiratory tract. Cough, shortness of breath, headache, nausea.

See section 11.

4.3. Indication of any immediate medical attention and special treatment needed

- Obtain medical assistance.
- Treat with corticosteroid spray as soon as possible after inhalation.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Carbon dioxide.
Dry powder.
Be aware of the risk of formation of static electricity with the use of CO2 extinguishers. Do not use them in places where a flammable atmosphere may be present.
Product does not burn, use fire control measures appropriate for the surrounding fire.
- Unsuitable extinguishing media : Do not use extinguishing media containing water.
Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

- Specific hazards : Water reactive product.
Exposure to fire may cause containers to rupture/explode.
- Hazardous combustion products : None that are more hazardous than the product itself.

5.3. Advice for firefighters

- Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.
If possible, stop flow of product.
Use water spray or fog to knock down fire fumes if possible.
Move containers away from the fire area if this can be done without risk.
- Special protective equipment for fire fighters : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus.
Standard EN 943-2: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Gas-tight chemical protective suits for emergency teams.
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel : Act in accordance with local emergency plan.
Try to stop release.
Evacuate area.
Ensure adequate air ventilation.
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
Stay upwind.
See section 8 of the SDS for more information on personal protective equipment.

Safety Data Sheet

Boron trifluoride

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS Reference Number: D-BF3-007

For emergency responders

- : Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
- Use chemically protective clothing.
- Monitor concentration of released product.
- See section 5.3 of the SDS for more information.

6.2. Environmental precautions

Try to stop release.

6.3. Methods and material for containment and cleaning up

Do not use water on leaking product.

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Safe use of the product

- : Avoid contact with aluminium.
- Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
- Avoid exposure, obtain special instructions before use.
- Do not smoke while handling product.
- Avoid suck back of water, acid and alkalis.
- Only experienced and properly instructed persons should handle gases under pressure.
- Ensure the complete gas system was (or is regularly) checked for leaks before use.
- Installation of a cross purge assembly between the container and the regulator is recommended.
- Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service.
- The product must be handled in accordance with good industrial hygiene and safety procedures.
- Consider pressure relief device(s) in gas installations.
- Do not breathe gas.
- Avoid release of product into work area.
- Use only lubricants and sealings approved for the specific gas service.
- Do not use water on valves, flanges and other fittings.

Safety Data Sheet

Boron trifluoride

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS Reference Number: D-BF3-007

Safe handling of the gas receptacle

- : Do not allow backfeed into the container.
- Protect containers from physical damage; do not drag, roll, slide or drop.
- When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.
- Leave valve protection caps, when provided, in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use.
- If user experiences any difficulty operating valve discontinue use and contact supplier.
- Never attempt to repair or modify container valves or safety relief devices.
- Damaged valves should be reported immediately to the supplier.
- Keep container valve outlets clean and free from contaminants particularly oil and water.
- Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.
- Close container valve after each use and when empty, even if still connected to equipment.
- Never attempt to transfer gases from one cylinder/container to another.
- Never use direct flame or electrical heating devices to raise the pressure of a container.
- Do not remove or deface labels provided by the supplier for the identification of the content of the container.
- Suck back of water into the container must be prevented.
- Open valve slowly to avoid pressure shock.

7.2. Conditions for safe storage, including any incompatibilities

- Store locked up.
- Observe all regulations and local requirements regarding storage of containers.
- Containers should not be stored in conditions likely to encourage corrosion.
- Container valve guards or caps, when provided, should be in place.
- Containers should be stored in the vertical position and properly secured to prevent them from falling over.
- Stored containers should be periodically checked for general condition and leakage.
- Keep container below 50°C in a well ventilated place.
- Store containers in location free from fire risk and away from sources of heat and ignition.
- Keep away from combustible materials.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Boron trifluoride (7637-07-2)	
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Bortrifluorid
AGW (OEL TWA)	1 mg/m ³
	0.35 ppm
Peak exposure limitation factor	2(II)

Safety Data Sheet

Boron trifluoride

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS Reference Number: D-BF3-007

Remark	AGS - Ausschuss für Gefahrstoffe; Y - Ein Risiko der Fruchtschädigung braucht bei Einhaltung des Arbeitsplatzgrenzwertes und des biologischen Grenzwertes (BGW) nicht befürchtet zu werden
Regulatory reference	TRGS900

Boron trifluoride (7637-07-2)	
DNEL: Derived no effect level (Workers)	
Acute - local effects, inhalation	5 mg/m ³
Acute - systemic effects, inhalation	5 mg/m ³
Long-term - local effects, inhalation	1 mg/m ³
Long-term - systemic effects, inhalation	1 mg/m ³

Boron trifluoride (7637-07-2)	
PNEC: Predicted no effect concentration	
Aqua (freshwater)	1.9 mg/l
Aqua (marine water)	0.6 mg/l
Aquatic, intermittent releases	1.25 mg/l
Sediment, freshwater	2.6 mg/kg dwt
Sediment, marine water	1.92 mg/kg dwt
Micro-organisms in sewage treatment plant (STP)	10 mg/l

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Product to be handled in a closed system and under strictly controlled conditions.
Provide adequate general and local exhaust ventilation.
Preferably use permanent leak-tight installations (e.g. welded pipes).
Systems under pressure should be regularly checked for leakages.
Ensure exposure is below occupational exposure limits (where available).
Gas detectors should be used when toxic gases may be released.
Consider the use of a work permit system e.g. for maintenance activities.

8.2.2. Individual protection measures, e.g. personal protective equipment

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered:
PPE compliant to the recommended EN/ISO standards should be selected.

Safety Data Sheet

Boron trifluoride

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS Reference Number: D-BF3-007

- Eye/face protection : Wear goggles and a face shield when transfilling or breaking transfer connections.
Provide readily accessible eye wash stations and safety showers.
Standard EN 166 - Personal eye-protection - specifications.
Standard EN ISO 16321-1 - Eye and face protection for occupational use Part 1: General requirements.
- Skin protection
 - Hand protection : Wear working gloves when handling gas containers.
Wear chemically resistant protective gloves.
Standard EN 374 - Protective gloves against chemicals.
Standard EN 388 - Protective gloves against mechanical risks, performance level 1 or higher.
Recommended types include wrist gloves from leather or synthetic material with equivalent performance, fabric gloves, fabric gloves with leather palms.
Polyvinylchloride (PVC).
 - Other : Keep suitable chemically resistant protective clothing readily available for emergency use.
Standard EN943-1 - Full protective suits against liquid, solid and gaseous chemicals.
Wear safety shoes while handling containers.
Standard EN ISO 20345 - Personal protective equipment - Safety footwear.
- Respiratory protection : Recommended: Filter B (grey).
Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems.
Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known.
Use gas filters with full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers.
Gas filters do not protect against oxygen deficiency.
Standard EN 14387 - Gas filter(s), combined filter(s) and standard EN136, full face masks .
Keep self contained breathing apparatus readily available for emergency use.
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
- Thermal hazards : None in addition to the above sections.

8.2.3. Environmental exposure controls

Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

- Physical state at 20°C / 101.3kPa : Gas.
- Colour : Gives off white fumes in moist air. Colourless.

Odour : Pungent.

Melting point / Freezing point : -129 °C

Boiling point : -100 °C

Flammability : Non flammable.

Lower explosion limit : Not applicable.

Upper explosion limit : Not applicable.

Flash point	: Not applicable for gases and gas mixtures.
Auto-ignition temperature	: Non flammable.
Decomposition temperature	: Not applicable.
pH	: If dissolved in water pH-value will be affected.
Viscosity, kinematic	: No reliable data available.
Water solubility [20°C]	: 541000 mg/l Completely soluble.
Partition coefficient n-octanol/water (Log Kow)	: Not applicable for inorganic products.
Vapour pressure [20°C]	: Not applicable.
Vapour pressure [50°C]	: Not applicable.
Density and/or relative density	: Not applicable for gases and gas mixtures.
Relative vapour density (air=1)	: 2.4
Particle characteristics	: Not applicable for gases and gas mixtures. Nanoforms are not relevant for gases and gas mixtures.

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Oxidising properties	: No oxidising properties.
Critical temperature [°C]	: -12.3 °C

9.2.2. Other safety characteristics

Molar mass	: 68 g/mol
Other data	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Reacts violently with water.

10.4. Conditions to avoid

Avoid moisture in installation systems.

10.5. Incompatible materials

May react violently with alkalis.
Reacts with most metals in the presence of moisture, liberating hydrogen, an extremely flammable gas.
With water causes rapid corrosion of some metals.
Reacts with water to form corrosive acids.
Moisture.
For additional information on compatibility refer to ISO 11114.

10.6. Hazardous decomposition products

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

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity : Fatal if inhaled.

Boron trifluoride (7637-07-2)

LC50 Inhalation - Rat [ppm]	864 ppm/1h (ADR)
	432 ppm/4h (CLP)

Skin corrosion/irritation : Causes severe skin burns and eye damage.

Serious eye damage/irritation : Causes serious eye damage.

Respiratory or skin sensitisation : No known effects from this product.

Germ cell mutagenicity : No known effects from this product.

Carcinogenicity : No known effects from this product.

Toxic for reproduction : Fertility : No known effects from this product.

Toxic for reproduction : unborn child : No known effects from this product.

STOT-single exposure : Corrosive to the respiratory tract.
Severe corrosion to the respiratory tract at high concentrations.

Target organ(s) : Kidneys.

STOT-repeated exposure : May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard : Not applicable for gases and gas mixtures.

11.2. Information on other hazards

Other information : Delayed fatal pulmonary oedema possible.
Absorption of excessive fluorides can result in acute systemic fluorosis with hypocalcemia, interference with various metabolic functions and organ damage (heart, liver, kidneys).
The substance/mixture has no endocrine disrupting properties.

SECTION 12: Ecological information

12.1. Toxicity

Assessment : Classification criteria are not met.

EC50 48h - Daphnia magna [mg/l] : 73 - 226 mg/l

EC50 72h - Algae [mg/l] : 17.5 mg/l

LC50 96 h - Fish [mg/l] : 125 - 600 mg/l

12.2. Persistence and degradability

Assessment : Not applicable for inorganic products.

12.3. Bioaccumulative potential

Assessment : No data available.

12.4. Mobility in soil

Assessment : Because of its high volatility, the product is unlikely to cause ground or water pollution.
Partition into soil is unlikely.

12.5. Results of PBT and vPvB assessment

Assessment : Not classified as PBT or vPvB.

12.6. Endocrine disrupting properties

Assessment : The substance/mixture has no endocrine disrupting properties.

12.7. Other adverse effects

Other adverse effects : May cause pH changes in aqueous ecological systems.

Not classified as PMT or vPvM.

Effect on the ozone layer : No effect on the ozone layer.

Effect on global warming : No known effects from this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Gas may be scrubbed in alkaline solution under controlled conditions to avoid violent reaction.

Contact supplier if guidance is required.

Ensure that the emission levels from local regulations or operating permits are not exceeded.

Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at

<http://www.eiga.eu> for more guidance on suitable disposal methods.

Must not be discharged to atmosphere.

Return unused product in original container to supplier.

List of hazardous waste codes (from Commission Decision 2000/532/EC as amended) : 16 05 04 *: Gases in pressure containers (including halons) containing hazardous substances.

13.2. Additional information

External treatment and disposal of waste should comply with applicable local and/or national regulations.

SECTION 14: Transport information

14.1. UN number or ID number

In accordance with ADR / RID / IMDG / IATA / ADN

UN-No. : 1008

14.2. UN proper shipping name

Transport by road/rail/inland waterways (ADR/RID/ADN) : BORON TRIFLUORIDE

Transport by air (ICAO-TI / IATA-DGR) : Boron trifluoride

Transport by sea (IMDG) : BORON TRIFLUORIDE

14.3. Transport hazard class(es)

Labelling



2.3 : Toxic gases.
8 : Corrosive substances.

Transport by road/rail/inland waterways (ADR/RID/ADN)

Class : 2

Classification code : 2TC

Hazard identification number : 268

Tunnel Restriction : C/D - Tank carriage : Passage forbidden through tunnels of category C, D and E. Other carriage : Passage forbidden through tunnels of category D and E

Transport by sea (IMDG)

Class / Div. (Sub. risk(s)) : 2.3 (8)

Emergency Schedule (EmS) - Fire : F-C

Emergency Schedule (EmS) - Spillage : S-U

14.4. Packing group

Transport by road/rail/inland waterways (ADR/RID/ADN) : Not applicable.

Transport by air (ICAO-TI / IATA-DGR) : Not applicable.

Transport by sea (IMDG) : Not applicable.

14.5. Environmental hazards

Transport by road/rail/inland waterways (ADR/RID/ADN) : None.

Transport by air (ICAO-TI / IATA-DGR) : None.

Transport by sea (IMDG) : None.

14.6. Special precautions for user

Packing Instruction(s)

Transport by road/rail/inland waterways (ADR/RID/ADN) : P200.

Transport by air (ICAO-TI / IATA-DGR)

- Passenger and Cargo Aircraft : Forbidden.
- Cargo Aircraft only : Forbidden.

Transport by sea (IMDG) : P200.

Safety Data Sheet

Boron trifluoride

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS Reference Number: D-BF3-007

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment.
Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.
Before transporting product containers:
- Ensure there is adequate ventilation.
- Ensure that containers are firmly secured.
- Ensure valve is closed and not leaking.
- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
- Ensure valve protection device (where provided) is correctly fitted.

14.7. Maritime transport in bulk according to IMO instruments

Not applicable.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU-Regulations

Restrictions on use : None.
Other information, restriction and prohibition regulations : None.
Not listed on the PIC list (Regulation EU 649/2012).
Not listed on the POP list (Regulation EU 2019/1021).
Seveso Directive : 2012/18/EU (Seveso III) : Listed.

Seveso III Part II (Named dangerous substances)	Qualifying quantity (tonnes)	
	Lower-tier	Upper-tier
36. Boron trifluoride	5	20

National regulations

Water hazard class (WGK) : 1 - Slightly hazardous to water.
Kenn-Nr. : 2786
Regulatory reference : Law on the Protection of Young People at Work (Jugendarbeitsschutzgesetz-JArbSchG)
Ordinance on Industrial Safety and Health (BetrSichV)
TRBS 3145/TRGS 745 - Transportable pressurized gas containers - Filling, holding, internal transport, emptying
TRGS 510 - Storage of hazardous substances in transportable containers
TRGS 407 - Activities with gases - Risk assessment
TRBS 2141 - Hazards due to steam and pressure - General requirements
The Ordinance on Installations for the Handling of Substances Hazardous to Water (AwSV)
Storage class according to TRGS 510: 2A Gases (without aerosol dispensers and lighters)
Technical Instructions on Air Quality Control (TA Luft).
Gesetz zum Schutz von Müttern bei der Arbeit, in der Ausbildung und im Studium (Mutterschutzgesetz - MuSchG)
Verordnung über Verbote und Beschränkungen des Inverkehrbringens gefährlicher Stoffe, Zubereitungen und Erzeugnisse nach dem Chemikaliengesetz (Chemikalien-Verbotsverordnung-ChemVerbotsV).

Safety Data Sheet

Boron trifluoride

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
 SDS Reference Number: D-BF3-007

15.2. Chemical safety assessment

A CSA has been carried out.

SECTION 16: Other information

- Indication of changes : Revised safety data sheet in accordance with commission regulation (EU) No 2020/878.
- Abbreviations and acronyms : ATE - Acute Toxicity Estimate.
 CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008.
 REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006.
 EINECS - European Inventory of Existing Commercial Chemical Substances.
 CAS# - Chemical Abstract Service number.
 PPE - Personal Protection Equipment.
 LC50 - Lethal Concentration to 50 % of a test population.
 RMM - Risk Management Measures.
 PBT - Persistent, Bioaccumulative and Toxic.
 vPvB - Very Persistent and Very Bioaccumulative.
 STOT- SE : Specific Target Organ Toxicity - Single Exposure.
 CSA - Chemical Safety Assessment.
 EN - European Standard.
 UN - United Nations.
 ADR - Agreement concerning the International Carriage of Dangerous Goods by Road.
 IATA - International Air Transport Association.
 IMDG code - International Maritime Dangerous Goods.
 RID - Regulations concerning the International Carriage of Dangerous Goods by Rail.
 WGK - Water Hazard Class.
 STOT - RE : Specific Target Organ Toxicity - Repeated Exposure.
 UFI : Unique Formula Identifier.
 ADN -International Carriage of Dangerous Goods by Inland Waterways.
 PROC -Process category.
 ERC – Environmental release category.
 PMT - Persistent, Mobile and Toxic.
 vPvM – very Persistent and very Mobile.
- Training advice : Users of breathing apparatus must be trained.
 Ensure operators understand the toxicity hazard.
- Further information : Classification in accordance with the procedures and calculation methods of Regulation (EC) 1272/2008 (CLP).
 Key literature references and sources of data are maintained in EIGA Doc 169 : 'Classification and Labelling Guide', downloadable at <http://www.Eiga.eu> .

Full text of H- and EUH-statements	
Acute Tox. 2 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 2
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Press. Gas (Liq.)	Gases under pressure : Liquefied gas

Safety Data Sheet

Boron trifluoride

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS Reference Number: D-BF3-007

Skin Corr. 1A	Skin corrosion/irritation, Category 1, Sub-Category 1A
STOT RE 2	Specific target organ toxicity – Repeated exposure, Category 2
STOT SE 3	Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation
H280	Contains gas under pressure; may explode if heated.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
H373	May cause damage to organs through prolonged or repeated exposure.
EUH014	Reacts violently with water.
EUH071	Corrosive to the respiratory tract.

DISCLAIMER OF LIABILITY

: Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.
Details given in this document are believed to be correct at the time of going to press.
Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

Safety Data Sheet

Boron trifluoride

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
 SDS Reference Number: D-BF3-007

Annex to the safety data sheet

Table of contents of the Annex

Identified Uses	Es N°	Short title	ERC	PROC	Page
Formulation of mixtures in pressure receptacles	EIGA007-1	Industrial uses, closed contained conditions	ERC2	PROC8b PROC9	17
Electronic component manufacture	EIGA007-1	Industrial uses, closed contained conditions	ERC5	PROC1 PROC8b PROC9	17
Manufacture of pharmaceutical products	EIGA007-1	Industrial uses, closed contained conditions	ERC6a	PROC1 PROC2 PROC3 PROC4 PROC8b PROC9	17
Transfilling in pressure receptacles	EIGA007-1	Industrial uses, closed contained conditions	ERC2	PROC8b PROC9	17
Feedstock in chemical processes	EIGA007-1	Industrial uses, closed contained conditions	ERC6a	PROC1 PROC2 PROC3 PROC4 PROC8b PROC9	17
Catalyst in polymer production	EIGA007-1	Industrial uses, closed contained conditions	ERC4	PROC1 PROC2 PROC3 PROC4 PROC8b PROC9	17

Exposure scenario

Boron trifluoride

Annex to the safety data sheet

Reference number: D-BF3-007

CAS-No.: 7637-07-2 Product form: Substance Physical state: Gas

1. EIGA007-1: Industrial uses, closed contained conditions

1.1. Title section

Industrial uses, closed contained conditions

ES Ref.: EIGA007-1

Version: 1.0

Processes, tasks, activities covered	Industrial uses, including product transfers and associated laboratory activities within different closed or contained systems
--------------------------------------	--

Environment	Use descriptors
CS01	ERC2, ERC4, ERC5, ERC6a

Worker	Use descriptors
CS02	PROC1
CS03	PROC2
CS04	PROC3
CS05	PROC4
CS06	PROC8b
CS07	PROC9

Assessment method	ECETOC TRA 2.0
-------------------	----------------

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: ERC2, ERC4, ERC5, ERC6a

ERC2	Formulation into mixture
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC5	Use at industrial site leading to inclusion into/onto article
ERC6a	Use of intermediate

Product (article) characteristics

Physical form of product	Liquefied gas
--------------------------	---------------

Exposure scenario

Boron trifluoride

Annex to the safety data sheet

Reference number: D-BF3-007

CAS-No.: 7637-07-2 Product form: Substance Physical state: Gas

Concentration of substance in product	≤ 100 %
---------------------------------------	---------

Amount used, frequency and duration of use (or from service life)	
The actual tonnage handled per site is not considered to influence the immissions as such for this scenario as there is practically no release	

Technical and organisational conditions and measures	
No additional requirement	
Ensure operatives are trained to minimise releases	

Conditions and measures related to sewage treatment plant	
Not applicable as there is no release to wastewater	

Conditions and measures related to treatment of waste (including article waste)	
See section 13 of the SDS. No additional information	

1.2.2. Control of worker exposure: PROC1

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
-------	--

Product (article) characteristics	
Physical form of product	See section 9 of the SDS, No additional information
Concentration of substance in product	≤ 100 %

Amount used (or contained in articles), frequency and duration of use/exposure	
The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation and level of containment/automation (as reflected in the technical conditions) is the main determinant of the process-intrinsic emission potential.	
Exposure duration	≤ 8 h/day
Covers frequency up to:	5 days/week

Exposure scenario

Boron trifluoride

Annex to the safety data sheet

Reference number: D-BF3-007

CAS-No.: 7637-07-2 Product form: Substance Physical state: Gas

Technical and organisational conditions and measures	
Handle product within a closed system. Provide extract ventilation to points where emissions could occur	
Ensure operatives are trained to minimise exposure	

Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection measures have to be applied in case of potential exposure only.	

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	
Indoor use	

1.2.3. Control of worker exposure: PROC2

PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
-------	--

Product (article) characteristics	
Physical form of product	See section 9 of the SDS, No additional information
Concentration of substance in product	≤ 100 %

Amount used (or contained in articles), frequency and duration of use/exposure	
The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation and level of containment/automation (as reflected in the technical conditions) is the main determinant of the process-intrinsic emission potential.	
Exposure duration	≥ 4 h/day
Covers frequency up to:	5 days/week

Technical and organisational conditions and measures	
Handle product within a closed system. Provide extract ventilation to points where emissions could occur. Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Fill containers at dedicated fill points supplied with local extract ventilation. Drain down and flush system prior to equipment break-in or maintenance. See sections 2 and 7 of the SDS.	
Ensure operatives are trained to minimise exposure	

Exposure scenario

Boron trifluoride

Annex to the safety data sheet

Reference number: D-BF3-007

CAS-No.: 7637-07-2 Product form: Substance Physical state: Gas

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear a respirator providing a minimum efficiency of (%):	95 Personal protection measures have to be applied in case of potential exposure only.
Use suitable eye protection. Wear chemically resistant protective gloves. Wear suitable face shield. Wear suitable coveralls to prevent exposure to the skin	Personal protection measures have to be applied in case of potential exposure only.

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	
Indoor or outdoor use	

1.2.4. Control of worker exposure: PROC3

PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
-------	--

Product (article) characteristics	
Physical form of product	See section 9 of the SDS, No additional information
Concentration of substance in product	≤ 100 %

Amount used (or contained in articles), frequency and duration of use/exposure	
The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation and level of containment/automation (as reflected in the technical conditions) is the main determinant of the process-intrinsic emission potential.	
Exposure duration	≥ 4 h/day
Covers frequency up to:	5 days/week

Technical and organisational conditions and measures	
Handle product within a closed system. Provide extract ventilation to points where emissions could occur. Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Fill containers at dedicated fill points supplied with local extract ventilation. Drain down and flush system prior to equipment break-in or maintenance. See sections 2 and 7 of the SDS.	
Ensure operatives are trained to minimise exposure	

Exposure scenario

Boron trifluoride

Annex to the safety data sheet

Reference number: D-BF3-007

CAS-No.: 7637-07-2 Product form: Substance Physical state: Gas

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear a respirator providing a minimum efficiency of (%):	95 Personal protection measures have to be applied in case of potential exposure only.
Use suitable eye protection. Wear chemically resistant protective gloves. Wear suitable face shield. Wear suitable coveralls to prevent exposure to the skin	Personal protection measures have to be applied in case of potential exposure only.

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	
Indoor or outdoor use	

1.2.5. Control of worker exposure: PROC4

PROC4	Chemical production where opportunity for exposure arises
-------	---

Product (article) characteristics	
Physical form of product	See section 9 of the SDS, No additional information
Concentration of substance in product	≤ 100 %

Amount used (or contained in articles), frequency and duration of use/exposure	
The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation and level of containment/automation (as reflected in the technical conditions) is the main determinant of the process-intrinsic emission potential.	
Exposure duration	≥ 4 h/day
Covers frequency up to:	5 days/week

Technical and organisational conditions and measures	
Handle product within a closed system. Provide extract ventilation to points where emissions could occur. Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Fill containers at dedicated fill points supplied with local extract ventilation. Drain down and flush system prior to equipment break-in or maintenance. See sections 2 and 7 of the SDS.	
Ensure operatives are trained to minimise exposure	

Exposure scenario

Boron trifluoride

Annex to the safety data sheet

Reference number: D-BF3-007

CAS-No.: 7637-07-2 Product form: Substance Physical state: Gas

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear a respirator providing a minimum efficiency of (%):	95 Personal protection measures have to be applied in case of potential exposure only.
Use suitable eye protection. Wear chemically resistant protective gloves. Wear suitable face shield. Wear suitable coveralls to prevent exposure to the skin	Personal protection measures have to be applied in case of potential exposure only.

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	
Indoor or outdoor use	

1.2.6. Control of worker exposure: PROC8b

PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
--------	---

Product (article) characteristics	
Physical form of product	See section 9 of the SDS, No additional information
Concentration of substance in product	≤ 100 %

Amount used (or contained in articles), frequency and duration of use/exposure	
The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation and level of containment/automation (as reflected in the technical conditions) is the main determinant of the process-intrinsic emission potential.	
Exposure duration	≥ 4 h/day
Covers frequency up to:	5 days/week

Technical and organisational conditions and measures	
Handle product within a closed system. Provide extract ventilation to points where emissions could occur. Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Fill containers at dedicated fill points supplied with local extract ventilation. Drain down and flush system prior to equipment break-in or maintenance. See sections 2 and 7 of the SDS.	
Ensure operatives are trained to minimise exposure	

Exposure scenario

Boron trifluoride

Annex to the safety data sheet

Reference number: D-BF3-007

CAS-No.: 7637-07-2 Product form: Substance Physical state: Gas

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear a respirator providing a minimum efficiency of (%):	95 Personal protection measures have to be applied in case of potential exposure only.
Use suitable eye protection. Wear chemically resistant protective gloves. Wear suitable face shield. Wear suitable coveralls to prevent exposure to the skin	Personal protection measures have to be applied in case of potential exposure only.

Other conditions affecting workers exposure	
Assumes use at not more than 20°C above ambient temperature.	
Indoor or outdoor use	

1.2.7. Control of worker exposure: PROC9

PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
-------	---

Product (article) characteristics	
Physical form of product	See section 9 of the SDS, No additional information
Concentration of substance in product	≤ 100 %

Amount used (or contained in articles), frequency and duration of use/exposure	
The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario. Instead, the combination of the scale of operation and level of containment/automation (as reflected in the technical conditions) is the main determinant of the process-intrinsic emission potential.	
Exposure duration	≥ 4 h/day
Covers frequency up to:	5 days/week

Technical and organisational conditions and measures	
Handle product within a closed system. Provide extract ventilation to points where emissions could occur. Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Fill containers at dedicated fill points supplied with local extract ventilation. Drain down and flush system prior to equipment break-in or maintenance. See sections 2 and 7 of the SDS.	
Ensure operatives are trained to minimise exposure	

Exposure scenario

Boron trifluoride

Annex to the safety data sheet

Reference number: D-BF3-007

CAS-No.: 7637-07-2 Product form: Substance Physical state: Gas

Conditions and measures related to personal protection, hygiene and health evaluation

Wear a respirator providing a minimum efficiency of (%):	95 Personal protection measures have to be applied in case of potential exposure only.
Use suitable eye protection. Wear chemically resistant protective gloves. Wear suitable face shield. Wear suitable coveralls to prevent exposure to the skin	Personal protection measures have to be applied in case of potential exposure only.

Other conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature.

Indoor or outdoor use

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure: ERC2, ERC4, ERC5, ERC6a

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed

1.3.2. Worker exposure: PROC1

Since the product has corrosive properties, dermal exposure has to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Thus, dermal exposure is not assessed in this exposure scenario

Route of exposure and type of effects	Exposure estimate	Assessment conditions	RCR
Long term - Local - Inhalation	0.028 mg/m ³		0.028

1.3.3. Worker exposure: PROC2

Since the product has corrosive properties, dermal exposure has to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Thus, dermal exposure is not assessed in this exposure scenario

Route of exposure and type of effects	Exposure estimate	Assessment conditions	RCR
Long term - Local - Inhalation	0.706 mg/m ³	Indoor with LEV 90%	0.706

1.3.4. Worker exposure: PROC3

Since the product has corrosive properties, dermal exposure has to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Thus, dermal exposure is not assessed in this exposure scenario

Route of exposure and type of effects	Exposure estimate	Assessment conditions	RCR
Long term - Local - Inhalation	0.848 mg/m ³	ECETOC TRA 2.0; Indoor with LEV 90%	0.848

Exposure scenario

Boron trifluoride

Annex to the safety data sheet

Reference number: D-BF3-007

CAS-No.: 7637-07-2 Product form: Substance Physical state: Gas

1.3.5. Worker exposure: PROC4

Since the product has corrosive properties, dermal exposure has to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Thus, dermal exposure is not assessed in this exposure scenario

Route of exposure and type of effects	Exposure estimate	Assessment conditions	RCR
Long term - Local - Inhalation	0.848 mg/m ³	ECETOC TRA 2.0; Indoor with LEV 90%	0.848

1.3.6. Worker exposure: PROC8b

Since the product has corrosive properties, dermal exposure has to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Thus, dermal exposure is not assessed in this exposure scenario

1.3.7. Worker exposure: PROC9

Since the product has corrosive properties, dermal exposure has to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Thus, dermal exposure is not assessed in this exposure scenario

Route of exposure and type of effects	Exposure estimate	Assessment conditions	RCR
Long term - Local - Inhalation	0.565 mg/m ³	ECETOC TRA 2.0; Indoor with LEV 90%; exposure <1 h/day	0.565

1.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

1.4.1. Environment

Guidance - Environment	Check that RMMs and OCs are as described above or of equivalent efficiency
------------------------	--

1.4.2. Health

Guidance - Health	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. For scaling see : http://www.ecetoc.org/tra
-------------------	--

End of document