Safety data sheet
Boron trichloride

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

1.1. Product identifier
Product name
Boron trichloride

EC No (from EINECS): 233-658-4
CAS No: 10294-34-5
Index-Nr. 005-002-00-5
Chemical formula BCl3
REACH Registration number:
Not available.

1.2. Relevant identified uses of the substance or mixture and uses advised against
Relevant identified uses
Industrial and professional. Perform risk assessment prior to use.
Uses advised against
Consumer use.

1.3. Details of the supplier of the safety data sheet
Company identification
BOC, PO Box 1201, Bluebell, Dublin
E-Mail Address ReachSDS@boc.com

1.4. Emergency telephone number
Emergency phone numbers (24h): 1850 333 435

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification acc. to Regulation (EC) No 1272/2008/EC (CLP/GHS)
Press. Gas (Liquefied gas) - Contains gas under pressure; may explode if heated.
Acute Tox. 2 - Reacts violently with water.
Skin Corr. 1B - Fatal if inhaled.
- Fatal if swallowed.
- Causes severe skin burns and eye damage.
- Corrosive to the respiratory tract.

Classification acc. to Directive 67/548/EEC & 1999/45/EC
R14 **|** T+; R26/28 **|** C; R34
Reacts violently with water.
Very toxic by inhalation and if swallowed.
Causes burns (to eyes, respiratory system and skin).
Risk advice to man and the environment
Liquefied gas.

2.2. Label elements
- Labelling Pictograms

- Signal word
Danger

- Hazard Statements

H280	Contains gas under pressure; may explode if heated.
EUH014	Reacts violently with water.
H330	Fatal if inhaled.
H300	Fatal if swallowed.
H314	Causes severe skin burns and eye damage.
EUH071	Corrosive to the respiratory tract.

- Precautionary Statements

Precautionary Statement Prevention

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

Precautionary Statement Response

P304+P340+P315	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get immediate medical advice/attention.
P303+P361+P353+P315	IF ON SKIN (or hair): Remove / Take off immediately all contaminated clothes. Rinse skin with water/shower. Get immediate medical advice/attention.
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/attention.

Precautionary Statement Storage

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

Precautionary Statement Disposal
None.

2.3. Other hazards
Contact with liquid may cause cold burns/frost bite.

SECTION 3: Composition/information on ingredients

Substance / Mixture: Substance.

3.1. Substances
Boron trichloride
CAS No: 10294-34-5
Index-Nr.: 005-002-00-5
EC No (from EINECS): 233-658-4
REACH Registration number:
Not available.
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
First Aid General Information:
Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
First Aid Inhalation:
Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
First Aid Skin / Eye:
May cause severe chemical burns to skin and cornea. Suitable first-aid treatment should be immediately available. Seek medical advice

before using product. For liquid spillage - flush with water for at least 15 minutes. In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance. Immediately flush eyes thoroughly with water for at least 15 minutes.
First Aid 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. May result in pulmonary oedema.

4.3. Indication of any immediate medical attention and special treatment needed
Obtain medical assistance. Treat with a corticosteroid spray as soon as possible after inhalation. Recommendations to physicians: Provide oxygen.

SECTION 5: Fire fighting measures

5.1. Extinguishing media
Suitable extinguishing media
Dry powder. Carbon dioxide. Foam. Use water spray or fog to control fire fumes.
Unsuitable extinguishing media
Do not use a solid water stream.

5.2. Special hazards arising from the substance or mixture
Specific hazards
Exposure to fire may cause containers to rupture/explode.
Hazardous combustion products
None that are more toxic than the product itself.

5.3. Advice for fire-fighters
Specific methods
If possible, stop flow of product. Move container away or cool with water from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.
Special protective equipment for fire-fighters
Gas tight chemically protective clothing (Type 1) in combination with self contained breathing apparatus. EN 943-2:2002: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Performance requirements for gas-tight (Type 1) chemical protective suits for emergency teams (ET).

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Evacuate area. Use self-contained breathing apparatus and chemically protective clothing. Ensure adequate air ventilation. Use protective clothing. Monitor concentration of released product. EN 137 Respiratory protective devices — Self-contained open-circuit compressed air breathing apparatus with full face mask — Requirements, testing, marking.

6.2. Environmental precautions
Try to stop release. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Reduce vapour with fog or fine water spray.

6.3. Methods and material for containment and cleaning up
Ventilate area. Wash contaminated equipment or sites of leaks with copious quantities of water. Hose down area with water.

6.4. Reference to other sections
See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Only experienced and properly instructed persons should handle gases under pressure. The substance must be handled in accordance with good industrial hygiene and safety procedures. 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. Ensure the complete gas system has been (or is regularly) checked for leaks before use. Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service. Avoid suckback of water, acid and alkalis. Refer to supplier's handling instructions. Do not allow backfeed into the container. Protect containers from physical damage; do not drag, roll, slide or drop. When moving containers, even for short distances, use appropriate equipment eg. trolley, hand truck, fork truck etc. Leave valve protection caps 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 container 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 contaminates 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 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 container contents.

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

7.3. Specific end use(s)
None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
Exposure limit value

Value type	value	Note
Great Britain - LTEL	1 ppm	EH 40/07
Great Britain - STEL	5 ppm	EH 40/07

OELs for Boron trichloride have not been established. The exposure limits of Hydrogen chloride have been used on this SDS as Hydrogen chloride is a hydrolysis product of Boron trichloride.

8.2. Exposure controls
Appropriate engineering controls

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. Preferably use permanent leak-tight connections (eg. welded pipes). Systems under pressure should be regularly checked for leakages. Gas detectors should be used when toxic quantities may be released. Provide adequate general or local ventilation. Consider work permit system e.g. for maintenance activities. Product to be handled in a closed system and under strictly controlled conditions.

Personal protective equipment

Eye and face protection

Protect eyes, face and skin from liquid splashes. Wear a face-shield when transfilling and breaking transfer connections. Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes. Full-face mask recommended

Guideline:

EN136 Respiratory protective devices. Full face masks. Requirements, testing, marking

Skin protection

Hand protection

Advice: Wear cold insulating gloves.

Manufacturer: EN 511 Protective gloves against cold.

Advice: Chemically resistant gloves complying with EN 374 should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Material: Neoprene

Guideline: EN 374-1/2/3 Protective gloves against chemicals and micro-organisms.

Advice: Wear working gloves and safety shoes while handling containers.

Body protection

Protect eyes, face and skin from contact with product. Keep suitable chemically resistant protective clothing readily available for emergency use. Personal protective equipment for the body should be selected based on the task being performed and the risks involved.

Guideline:

EN 943: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Performance requirements for gas-tight (Type 1) chemical protective suits for emergency teams

Other protection

Wear working gloves and safety shoes while handling containers. ISO 20345 Safety footwear.

Respiratory protection

Keep self contained breathing apparatus readily available for emergency use., Use SCBA in the event of high concentrations, The selection of the Respiratory Protective Device (RPD) must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected RPD., When allowed by a risk assessment Respiratory Protective Equipment (RPE) may be used.

Guideline:

EN136 Respiratory protective devices. Full face masks. Requirements, testing, marking

Respiratory protection

For short term use:

Material:

Filter B-P3

Guideline:

EN 14387: Respiratory protective devices. Gas filter(s) and combined filter(s). Requirements, testing, marking

Thermal hazards

If there is a risk of contact with the liquid, all protective equipment should be suitable for extremely low temperatures.

Environmental Exposure Controls

Specific risk management measures are not required beyond good industrial hygiene and safety procedures. 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

General information

Appearance/Colour: Colourless gas. Gives off white fumes in moist air.

Odour: Pungent

Odour threshold:

Odour threshold is subjective and inadequate to warn for over exposure.

pH value: If dissolved in water pH-value will be affected.

Melting point: -107 °C

Boiling point: 12,5 °C

Flash point: Not applicable for gases and gas mixtures.

Evaporation rate:

Not applicable for gases and gas mixtures.

Flammability range: Non flammable.

Vapour Pressure 20 °C: 1,6 bar

Relative density, gas: 4

Solubility in water: Hydrolyses.

Partition coefficient: n-octanol/water:

Not applicable.

Autoignition temperature: Not applicable.

Viscosity:

Dynamic: 1,032 mPa.s

Molecular weight: 117 g/mol

Critical temperature: 178,8 °C

Relative density, liquid: 1,3

9.2. Other information

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

10.1. Reactivity

Unreactive under normal conditions.

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

Moisture. 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. May react violently with alkalis. For material compatibility see latest version of 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 toxicological effects
Acute inhalation toxicity
Value: LC50
Species: Rat
Exposure time: 1 h
Value in non-standard unit: 2541 ppm
Acute dermal toxicity
No data available.
Skin irritation
Species: Rabbit
Corrosive.
Eye irritation
Corrosive.
Sensitization
Not determined
Assessment mutagenicity
No known effects from this product.
Assessment carcinogenicity
No known effects from this product.
Assessment toxicity to reproduction
No known effects from this product.
Assessment teratogenicity
No known effects from this product.
Experiences with human exposure
Irritation of respiratory tract.

Irritates mucous membranes

Inhalation can cause damage to respiratory tract and lungs.

Risk of serious health injuries in case of long term exposure.
Specific Target Organ Toxicity (STOT) - Single Exposure
Organ: Kidneys

Organ: Lungs
Specific Target Organ Toxicity (STOT) - Repeated Exposure
No data available.

Aspiration hazard
Not applicable to gases and gas mixtures

SECTION 12: Ecological information

12.1. Toxicity
No data available.

12.2. Persistence and degradability
No data available.

12.3. Bioaccumulative potential
No data available.

12.4. Mobility in soil
No data available.

12.5. Results of PBT and vPvB assessment
No data available.

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

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Must not be discharged to atmosphere. Do not discharge into any place where its accumulation could be dangerous. Contact supplier if guidance is required. Refer to the EIGA code of practice (Doc.30 “Disposal of Gases", downloadable at http://www.eiga.org) for more guidance on suitable disposal methods.
Gases in pressure containers (including halons) containing dangerous substances
EWC Nr. 16 05 04*

SECTION 14: Transport information

ADR/RID

14.1. UN number
1741

14.2. UN proper shipping name
Boron Trichloride

14.3. Transport hazard class(es)
Class: 2
Classification Code: 2TC
Labels: 2.3, 8
Hazard number: 268
Tunnel restriction code: (C/D)
Emergency Action Code: 2WE

14.4. Packing group (Packing Instruction)
P200

14.5. Environmental hazards
None.

14.6. Special precautions for user
None.

IMDG

14.1. UN number
1741

14.2. UN proper shipping name
Boron Trichloride

14.3. Transport hazard class(es)
Class: 2.3
Labels: 2.3, 8
EmS: FC,SU,

14.4. Packing group (Packing Instruction)
P200

14.5. Environmental hazards
None.

14.6. Special precautions for user
None.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
Not applicable.

IATA

14.5. Environmental hazards
None.

14.6. Special precautions for user
None.

Other transport information

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 that they are firmly secured. Ensure that the valve outlet cap nut or plug (where provided) is correctly fitted. Ensure that the valve protection device (where provided) is correctly fitted. Ensure adequate ventilation. Ensure compliance with applicable regulations. Ensure that the container valve is closed and not leaking.

SECTION 15: Regulatory information

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

Seveso Directive 96/82/EC: Covered

Other regulations

Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work
Directive 94/9/EC on equipment and protective systems intended for use in potentially explosive atmospheres (ATEX)
Directive 89/686/EEC on personal protective equipment
Council Directive 67/548/EEC on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances
Directive 1999/45/EC concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations
Directive 97/23/EC on the approximation of the laws of the Member States concerning pressure equipment.

15.2. Chemical safety assessment

CSA has not been carried out.

SECTION 16: Other information

Ensure all national/local regulations are observed. Ensure operators understand the toxicity hazard. Users of breathing apparatus must be trained. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

Advice

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. Details given in this document are believed to be correct at the time of going to press.

Further information

Note:
When using this document care should be taken, as the decimal sign and its position complies with rules for the structure and drafting of international standards, and is a comma on the line.
As an example 2,000 is two (to three decimal places) and not two thousand, whilst 1.000 is one thousand and not one (to three decimal places).

References

Various sources of data have been used in the compilation of this SDS, they include but are not exclusive to:, European Chemical Agency: Guidance on the Compilation of Safety Data Sheets., European Chemical Agency: Information on Registered Substances http://apps.echa.europa.eu/registered/registered-sub.aspx#search , European Industrial Gases Association (EIGA) Doc. 918/11 Classification, Labelling and Safety data sheet guide., ISO 10156:2010 Gases and gas mixtures -- Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets., International Programme on Chemical Safety (http://www.inchem.org/), Matheson Gas Data Book, 7th Edition., National Institute for Standards and Technology (NIST) Standard Reference Database Number 69, The ESIS (European chemical Substances 5 Information System) platform of the former European Chemicals Bureau (ECB) ESIS (http://ecb.jrc.ec.europa.eu/esis/)., The European Chemical Industry Council (CEFIC) ERICards., United States of America's National Library of Medicine's toxicology data network TOXNET (http://toxnet.nlm.nih.gov/index.html), Substance specific information from suppliers.
EH40 (as ammended) Workplace exposure limits.

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