



Boron trichloride

Safety Data Sheet

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

Reference number: EIGA006

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

1.1. Product identifier

Product form	:	Substance
Name	:	Boron trichloride
Trade name	:	Boron trichloride 4.0; Boron trichloride 5.0
EC Index-No.	:	005-002-00-5
EC-No.	:	233-658-4
CAS-No.	:	10294-34-5
REACH registration No.	:	01-2119962197-29
Product code	:	000010021839
Formula	:	BCl ₃

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

1.2.1. Relevant identified uses

Relevant identified uses	:	Industrial use. Perform risk assessment prior to use. Test gas/Calibration gas. Chemical reaction / Synthesis. Use for manufacture of electronic/photovoltaic components.
Use of the substance/mixture	:	Formulation of mixtures with gas in pressure receptacles. Using gas as feedstock in chemical processes. Raw material for pharmaceutical products Electronic component manufacture

Title	Life cycle stage	Use descriptors
Formulation (re)packing of substances and mixtures (ES Ref.: ES0110021839)	Industrial, Manufacture, Formulation	PC0, PROC1, PROC8b, ERC2
Using gas as feedstock in chemical processes. (ES Ref.: ES0210021839)	Industrial, Manufacture	SU9, PC21, PROC1, PROC8b, ERC6a
Use for manufacture of electronic/photovoltaic components. (ES Ref.: ES0310021839)	Industrial, Manufacture	SU16, PC33, PROC1, ERC6a
Manufacture of pharmaceutical products (ES Ref.: ES0410021839)	Industrial, Manufacture	SU9, PC29, PROC2, PROC3, ERC6a
Preparation of material for application (ES Ref.: ES0510021839)	Industrial, Manufacture	SU16, PC33, PROC1, ERC6a

Full text of use descriptors: see section 16

1.2.2. Uses advised against

Uses advised against	:	Consumer use. Uses other than those listed above are not supported, contact your supplier for more information on other uses.
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1.3. Details of the supplier of the safety data sheet

Linde Gas GmbH

Carl-von-Linde-Platz 1

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A-4651 Stadl-Paura
Austria
T +43 50 4273
office@at.linde-gas.com

1.4. Emergency telephone number

Emergency number : UMCO/NCEC: +44 1865 407333 (English); +49 89 220 61012 (German)

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 (oral), Category 2	H300
	Acute toxicity (inhalation:gas) Category 2	H330
	Skin corrosion/irritation, Category 1, Sub-Category 1B	H314
	Serious eye damage/eye irritation, Category 1	H318
	Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation	H335

Full text of H- and EUH-statements: see section 16

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

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

Hazard pictograms (CLP) :



GHS04

GHS05

GHS06

Signal word (CLP)

: Danger

Hazard statements (CLP)

: H280 - Contains gas under pressure; may explode if heated.

H300 - Fatal if swallowed.

H314 - Causes severe skin burns and eye damage.

H330 - Fatal if inhaled.

EUH-statements

: EUH014 - Reacts violently with water.

EUH071 - Corrosive to the respiratory tract.

EUH071 supersedes H335 when assigned in the classification.

Precautionary statements (CLP)

- Prevention

: P260 - Do not breathe gas, vapours.

P280 - Wear eye protection, face protection, protective clothing, protective gloves.

: 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

: P403 - Store in a well-ventilated place.

P405 - Store locked up.

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2.3. Other hazards

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

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 trichloride	CAS-No.: 10294-34-5 EC-No.: 233-658-4 EC Index-No.: 005-002-00-5 REACH-no: 01-2119962197-29	100	Press. Gas (Liq.), H280 Acute Tox. 2 (Oral), H300 (ATE=5 mg/kg bodyweight) Acute Tox. 2 (Inhalation:gas), H330 (ATE=100 ppmv/4h) Skin Corr. 1B, H314 Eye Dam. 1, H318 STOT SE 3, H335 EUH014 EUH071

Specific concentration limits:

Name	Product identifier	Specific concentration limits
Boron trichloride	CAS-No.: 10294-34-5 EC-No.: 233-658-4 EC Index-No.: 005-002-00-5 REACH-no: 01-2119962197-29	(1 ≤ C ≤ 100) STOT SE 3; H335

Full text of H- and EUH-statements: see section 16

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 measures after 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.

First-aid measures after skin contact : Remove contaminated clothing. Drench affected area with water for at least 15 minutes.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

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

Most important symptoms and effects, both acute and delayed Prolonged exposure to small concentrations may result in pulmonary oedema. Delayed adverse effects possible. 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 mucous membranes and upper respiratory tract. Cough, shortness of breath, headache, nausea. See section 11.

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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. Product does not burn, use fire control measures appropriate for the surrounding fire. Be aware of the risk of formation of static electricity with the use of CO ₂ extinguishers. Do not use them in places where a flammable atmosphere may be present.
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

Reactivity in case of fire	: No reactivity hazard other than the effects described in sub-sections below.
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

6.1.1. For non-emergency personnel

Emergency procedures	: 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.
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6.1.2. For emergency responders

Emergency procedures	: 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.
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6.2. Environmental precautions

Try to stop release.

6.3. Methods and material for containment and cleaning up

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.

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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.

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

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.

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1 National occupational exposure and biological limit values

No additional information available

8.1.2. Recommended monitoring procedures

No additional information available

8.1.3. Air contaminants formed

No additional information available

8.1.4. DNEL and PNEC

Boron trichloride (10294-34-5)	
DNEL/DMEL (Workers)	
Acute - local effects, inhalation	16 ppm
Long-term - systemic effects, inhalation	16 mg/m ³
Long-term - local effects, inhalation	8 mg/m ³
PNEC (Water)	
PNEC aqua (freshwater)	0.039 mg/l
PNEC aqua (marine water)	0.039 mg/l
PNEC aqua (intermittent, freshwater)	0.048 mg/l
PNEC (Sediment)	
PNEC sediment (freshwater)	0.039 mg/kg dwt
PNEC sediment (marine water)	0.039 mg/kg dwt
PNEC (Soil)	
PNEC soil	11 mg/kg dwt
PNEC (STP)	
PNEC sewage treatment plant	0.039 mg/l

8.1.5. Control banding

No additional information available

8.2. Exposure controls

Appropriate engineering controls

Appropriate engineering controls:

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

Personal protection equipment

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.

Personal protective equipment symbol(s):



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Eye and face protection

Eye 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

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. Chloroprene rubber (Neoprene®) (CR)

Respiratory protection

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. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. 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.

Thermal hazards

Thermal hazard protection:

None in addition to the above sections.

Environmental exposure controls

Environmental exposure controls:

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

Other information:

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.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

: Gas

: Gives off white fumes in moist air. Colourless.

Physical state

: Liquefied gas

Colour

: Pungent.

Form

: Odour threshold is subjective and inadequate to warn of overexposure.

Odour

: -107 °C

Odour threshold

: Not applicable

Melting point

: 12.5 °C

Freezing point

: Non flammable.

Boiling point

: No oxidising properties.

Flammability

: Not available

Oxidising properties

: Not applicable.

Explosive limits

: Not applicable.

Lower explosion limit

: Not applicable for gases and gas mixtures.

Upper explosion limit

: Non flammable.

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

: Not applicable for gases and gas mixtures.

Viscosity, dynamic

: 0.011 mPa·s @ 20 °C; Experimental result, Key study; Not applicable for gases and gas mixtures.

Solubility in water

: Completely soluble.

Partition coefficient n-octanol/water (Log Kow)

: Not applicable for inorganic products.

Partition coefficient n-octanol/water (Log Pow)

: Not applicable for gas mixtures.

Vapour pressure

: 1.6 bar(a)

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Vapour pressure at 50°C	: 3.2 bar(a)
Critical pressure	: 3870 kPa
Density	: 1.3728 g/cm³ 0 °C
Relative density	: 1.3
Relative vapour density at 20°C	: Not applicable.
Relative gas density	: 4
Particle characteristics	: Not applicable 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

Critical temperature	: 181.9 °C
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9.2.2. Other safety characteristics

Molecular mass	: 117 g/mol
Gas group	: Press. Gas (Liq.)
Additional 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

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.
Acute toxicity (oral)	: Fatal if swallowed.
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Inhalation:gas: Fatal if inhaled.

Boron trichloride (10294-34-5)

LC50 Inhalation - Rat [ppm]	2541 ppm/1h (ADR) 194 ppm/4h (CLP)
Skin corrosion/irritation	: Causes severe skin burns and eye damage. pH: If dissolved in water pH-value will be affected.
Serious eye damage/irritation	: Causes serious eye damage. pH: If dissolved in water pH-value will be affected.

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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.
Reproductive toxicity	: Not classified
Toxic for reproduction : Fertility	: No known effects from this product.
Toxic for reproduction : unborn child	: No known effects from this product.
STOT-single exposure	: Severe corrosion to the respiratory tract at high concentrations.
Target organ(s)	: Respiratory tract.
STOT-repeated exposure	: No known effects from this product.
Aspiration hazard	: Not applicable for gases and gas mixtures.

Boron trichloride (10294-34-5)

Viscosity, kinematic	Not applicable for gases and gas mixtures.
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11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

No additional information available

11.2.2. Other information

Other information	: Delayed fatal pulmonary oedema possible, The substance/mixture has no endocrine disrupting properties.
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SECTION 12: Ecological information

12.1. Toxicity

Assessment	: Classification criteria are not met.
Hazardous to the aquatic environment, short-term (acute)	: Not classified
Hazardous to the aquatic environment, long-term (chronic)	: Not classified
Not rapidly degradable	

Boron trichloride (10294-34-5)

LC50 96 h - Fish [mg/l]	22 mg/l
EC50 48h - Daphnia magna [mg/l]	0.49 mg/l
EC50 72h - Algae [mg/l]	0.73 mg/l

12.2. Persistence and degradability

Boron trichloride (10294-34-5)

Assessment	Not applicable for inorganic products.
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12.3. Bioaccumulative potential

Boron trichloride (10294-34-5)

Partition coefficient n-octanol/water (Log Pow)	Not applicable for gas mixtures.
Partition coefficient n-octanol/water (Log Kow)	Not applicable for inorganic products.
Assessment	Product is an inorganic gas with a low potential to bioaccumulate in aquatic species.

12.4. Mobility in soil

Boron trichloride (10294-34-5)

Assessment	Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.
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12.5. Results of PBT and vPvB assessment

Assessment : Not classified as PBT or vPvB.

12.6. Endocrine disrupting properties

Other adverse effects : May cause pH changes in aqueous ecological systems. Not classified as PMT or vPvM.
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

Waste treatment methods : Gas may be scrubbed in alkaline solution under controlled conditions to avoid violent reaction. Contact supplier if guidance is required. Must not be discharged to atmosphere. 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. 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.
HP Code : HP5 - "Specific Target Organ Toxicity (STOT)/Aspiration Toxicity:" waste which can cause specific target organ toxicity either from a single or repeated exposure, or which cause acute toxic effects following aspiration.
HP6 - "Acute Toxicity:" waste which can cause acute toxic effects following oral or dermal administration, or inhalation exposure.
HP8 - "Corrosive:" waste which on application can cause skin corrosion.

13.2. Additional information

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

SECTION 14: Transport information

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

ADR	IMDG	IATA	ADN	RID
14.1. UN number or ID number				
UN 1741	UN 1741	UN 1741	UN 1741	UN 1741
14.2. UN proper shipping name				
BORON TRICHLORIDE	BORON TRICHLORIDE	Boron trichloride	BORON TRICHLORIDE	BORON TRICHLORIDE
Transport document description				
UN 1741 BORON TRICHLORIDE, 2.3 (8), (C/D)	UN 1741 BORON TRICHLORIDE, 2.3 (8)			
14.3. Transport hazard class(es)				
2.3 (8)	2.3 (8)	2.3 (8)	2.3 (8)	2.3 (8)

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ADR	IMDG	IATA	ADN	RID
		Not applicable		
14.4. Packing group				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
14.5. Environmental hazards				
Dangerous for the environment: No	Dangerous for the environment: No Marine pollutant: No	Dangerous for the environment: No	Dangerous for the environment: No	Dangerous for the environment: No
No supplementary information available				

14.6. Special precautions for user

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.

Overland transport

Classification code (ADR)	: 2TC
Limited quantities (ADR)	: 0
Excepted quantities (ADR)	: E0
Packing instructions (ADR)	: P200
Mixed packing provisions (ADR)	: MP9
Portable tank and bulk container instructions (ADR)	: (M)
Vehicle for tank carriage	: AT
Transport category (ADR)	: 1
Special provisions for carriage - Loading, unloading and handling (ADR)	: CV9, CV10, CV36
Special provisions for carriage - Operation (ADR)	: S14
Hazard identification number (Kemler No.)	: 268
Orange plates	: 
Tunnel restriction code (ADR)	: C/D

Transport by sea

Limited quantities (IMDG)	: 0
Excepted quantities (IMDG)	: E0
Packing instructions (IMDG)	: P200
EmS-No. (Fire)	: F-C
EmS-No. (Spillage)	: S-U
Stowage category (IMDG)	: D
Stowage and handling (IMDG)	: SW1, SW2
Properties and observations (IMDG)	: Non-flammable, toxic and corrosive gas. Forms dense white corrosive fumes in moist air. Reacts violently with water, evolving hydrogen chloride, an irritating and corrosive gas apparent as white fumes. In the presence of moisture, highly corrosive to most metals. Much heavier than air (2.35). Highly irritating to skin, eyes and mucous membranes.

Air transport

PCA Limited quantities (IATA)	: FORBIDDEN
PCA limited quantity max net quantity (IATA)	: FORBIDDEN

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PCA packing instructions (IATA)	:	FORBIDDEN
PCA max net quantity (IATA)	:	FORBIDDEN
CAO packing instructions (IATA)	:	FORBIDDEN
CAO max net quantity (IATA)	:	FORBIDDEN
Special provisions (IATA)	:	A2
ERG code (IATA)	:	2CP

Inland waterway transport

Classification code (ADN)	:	2TC
Limited quantities (ADN)	:	0
Excepted quantities (ADN)	:	E0
Equipment required (ADN)	:	PP, EP, TOX, A
Ventilation (ADN)	:	VE02
Number of blue cones/lights (ADN)	:	2

Rail transport

Classification code (RID)	:	2TC
Limited quantities (RID)	:	0
Excepted quantities (RID)	:	E0
Packing instructions (RID)	:	P200
Mixed packing provisions (RID)	:	MP9
Portable tank and bulk container instructions (RID)	:	(M)
Transport category (RID)	:	1
Special provisions for carriage - Loading, unloading and handling (RID)	:	CW9, CW10, CW36
Hazard identification number (RID)	:	268

14.7. Maritime transport in bulk according to IMO instruments

IBC code	:	Not applicable.
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SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

REACH Annex XVII (Restriction List)

Not listed on REACH Annex XVII

REACH Annex XIV (Authorisation List)

Not listed on REACH Annex XIV (Authorisation List)

REACH Candidate List (SVHC)

Contains no substance(s) listed on the REACH Candidate List

PIC Regulation (Prior Informed Consent)

Not listed on the PIC list (Regulation EU 649/2012)

POP Regulation (Persistent Organic Pollutants)

Not listed on the POP list (Regulation EU 2019/1021)

Ozone Regulation (1005/2009)

Not listed on the Ozone Depletion list (Regulation EU 2024/590)

VOC Directive (2004/42)

Restrictions on use : None.

Seveso Directive (Disaster Risk Reduction)

Seveso Directive : 2012/18/EU (Seveso III) : Covered.

Boron trichloride

Safety Data Sheet

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

Seveso III Part I (Categories of dangerous substances)	Qualifying quantity (tonnes)	
	Lower-tier	Upper-tier
H2 ACUTE TOXIC — Category 2, all exposure routes — Category 3, inhalation exposure route	50	200

Explosives Precursors Regulation (EU 2019/1148)

Contains no substance(s) listed on the Explosives Precursors list (Regulation EU 2019/1148 on the marketing and use of explosives precursors)

Drug Precursors Regulation (EC 273/2004)

Contains no substance(s) listed on the Drug Precursors list (Regulation EC 273/2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances)

15.1.2. National regulations

Ensure all national/local regulations are observed.

Safety data sheet in accordance with commission regulation (EU) No 2020/878.

Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work

Directive 2016/425/EEC on personal protective equipment

Directive 2014/34/EU on equipment and protective systems intended for use in potentially explosive atmospheres (ATEX)

Only products that comply with the food regulations (EC) No. 1333/2008 and (EU) No. 231/2012 and are labelled as such may be used as food additives.

This Safety Data Sheet has been produced to comply with Regulation (EU) 2015/830.

15.2. Chemical safety assessment

A CSA has been carried out.

SECTION 16: Other information

Indication of changes:

Safety data sheet in accordance with commission regulation (EU) No 2020/878.

Abbreviations and acronyms:	
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	ADR - Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	ATE - Acute Toxicity Estimate
BLV	Biological limit value
BOD	Biochemical oxygen demand (BOD)
CAO	Cargo Aircraft only / Cargo Aircraft only
CAS-No.	Chemical Abstract Service number
CLP	CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
COD	Chemical oxygen demand (COD)
CSA	CSA - Chemical Safety Assessment
DMEL	Derived Minimal Effect level
DNEL	Derived-No Effect Level
EC50	Median effective concentration
EC	European Inventory of Existing Commercial Chemical Substances
ED	Endocrine disruptor
EINECS	EINECS - European Inventory of Existing Commercial Chemical Substances
EN	European Standard
IARC	International Agency for Research on Cancer

Boron trichloride

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

Abbreviations and acronyms:	
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
IOELV	Indicative Occupational Exposure Limit Value
LC50	Median lethal concentration
LD50	Median lethal dose
LOAEL	Lowest Observed Adverse Effect Level
NOAEC	No-Observed Adverse Effect Concentration
NOAEL	No-Observed Adverse Effect Level
NOEC	No-Observed Effect Concentration
N.O.S.	Not Otherwise Specified
OECD	Organisation for Economic Co-operation and Development
OEL	Occupational Exposure Limit
PBT	Persistent Bioaccumulative Toxic
PCA	Passenger and Cargo Aircraft / Passenger and Cargo Aircraft
PNEC	Predicted No-Effect Concentration
PPE	PPE - Personal Protection Equipment
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
RMM	RMM - Risk Management Measures
STP	Sewage treatment plant
ThOD	Theoretical oxygen demand (ThOD)
TLM	Median Tolerance Limit
TRGS	Technical Rules for Hazardous Substances
STOT-RE	Specific Target Organ Toxicity-Repeated Exposure
STOT-SE	Specific Target Organ Toxicity-Single Exposure
UFI	Unique Formula Identifier
UN	UN - United Nations
VOC	Volatile Organic Compounds
vPvB	Very Persistent and Very Bioaccumulative
WGK	Water Hazard Class

Training advice : Users of breathing apparatus must be trained. Ensure operators understand the toxicity hazard.

Other 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
Acute Tox. 2 (Oral)	Acute toxicity (oral), Category 2
Eye Dam. 1	Serious eye damage/eye irritation, Category 1

Boron trichloride

Safety Data Sheet

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

Full text of H- and EUH-statements:	
Press. Gas (Liq.)	Gases under pressure : Liquefied gas
Skin Corr. 1B	Skin corrosion/irritation, Category 1, Sub-Category 1B
STOT SE 3	Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation
H280	Contains gas under pressure; may explode if heated.
H300	Fatal if swallowed.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
EUH014	Reacts violently with water.
EUH071	Corrosive to the respiratory tract.

Full text of use descriptors	
ERC2	Formulation into mixture
ERC6a	Use of intermediate
PC0	Other
PC21	Laboratory chemicals
PC29	Pharmaceuticals
PC33	Semiconductors
PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
SU16	Manufacture of computer, electronic and optical products, electrical equipment
SU9	Manufacture of fine chemicals

The classification complies with

: ATP 12

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 (SDS), EU AT

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Annex to the safety data sheet

This Annex documents the Exposure Scenarios (ESs) related to the identified uses of the registered substance. The ESs detail protective measures for workers and the environment in addition to those described in sections 7, 8, 11, 12 and 13 of the SDS that are required to ensure that the potential exposure to workers and the environment remains within acceptable levels for each of the identified uses.

Boron trichloride

Safety Data Sheet

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

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Boron trichloride

Annex to the safety data sheet: Exposure scenario

Reference number: EIGA006 CAS-No.: 10294-34-5 Product form: Substance Physical state: Gas

1. ES0110021839: Industrial uses, closed contained conditions

1.1. Title section

Industrial uses, closed contained conditions

ES Ref.: ES0110021839

Environment	Use descriptors
CS0110021839	ERC2

Worker	Use descriptors
CS0210021839	PROC1, PROC8b

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: ERC2

ERC2	Formulation into mixture
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Product (article) characteristics	
Physical form of product	See section 9 of the SDS.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use (or from service life)

Regional use tonnage:	No data available.
Batch process	Not relevant
Continuous process	Not relevant

Technical and organisational conditions and measures

See chapter 8 of the safety data sheet (Environmental exposure controls).	
Technical and organisational measures	Handle substance within a closed system
Air	100 % Air - minimum efficiency of
Soil	Not relevant
Water	100 % Water - minimum efficiency of
Remarks	Not relevant
	None

Conditions and measures related to sewage treatment plant

Not applicable as there is no release to wastewater	
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Boron trichloride

Annex to the safety data sheet: Exposure scenario

Reference number: EIGA006 CAS-No.: 10294-34-5 Product form: Substance Physical state: Gas

Conditions and measures related to treatment of waste (including article waste)	
See section 13 of the SDS	External treatment and disposal of waste should comply with applicable local and/or national regulations
See section 13 of the SDS	External recovery and recycling of waste should comply with applicable local and/or national regulations
Additional conditions - Environment	Ensure operatives are trained to minimise releases

Other conditions affecting environmental exposure	
Others	Not relevant

1.2.2. Control of worker exposure: PROC1, PROC8b

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
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.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used (or contained in articles), frequency and duration of use/exposure	
Amounts used	No data available
Hours per shift	5 days/week 8 h

Technical and organisational conditions and measures	
See Section 7	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	Transfer of substance or mixture (charging and discharging) at dedicated facilities
Local exhaust ventilation	Transfer of substance or mixture (charging and discharging) at dedicated facilities
inhalation exposure	See Section 7

Conditions and measures related to personal protection, hygiene and health evaluation	
See section 8 of the SDS for more information on personal protective equipment	

Additional conditions - Human health	
Additional conditions - Human health	Ensure supervision is in place to check that the RMMs are in place and are being used correctly and that the OCs are being followed

Other conditions affecting workers exposure	
	Not available

Boron trichloride

Annex to the safety data sheet: Exposure scenario

Reference number: EIGA006 CAS-No.: 10294-34-5 Product form: Substance Physical state: Gas

Others	See section 8 of the SDS.
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1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure: ERC2

No exposure assessment presented for the environment

1.3.2. Worker exposure: PROC1, PROC8b

No exposure assessment presented for human health

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
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Boron trichloride

Annex to the safety data sheet: Exposure scenario

Reference number: EIGA006 CAS-No.: 10294-34-5 Product form: Substance Physical state: Gas

2. ES0210021839: Industrial uses, closed contained conditions

2.1. Title section

Industrial uses, closed contained conditions

ES Ref.: ES0210021839

Environment	Use descriptors
CS0310021839	ERC6a

Worker	Use descriptors
CS0410021839	PROC1, PROC8b

2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: ERC6a

ERC6a	Use of intermediate
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Product (article) characteristics	
Physical form of product	See section 9 of the SDS.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use (or from service life)	
Regional use tonnage:	No data available.
Batch process	Not relevant
Continuous process	Not relevant

Technical and organisational conditions and measures	
See chapter 8 of the safety data sheet (Environmental exposure controls).	
Technical and organisational measures	Handle substance within a closed system
Air	100 % Air - minimum efficiency of
Soil	Not relevant
Water	100 % Water - minimum efficiency of
Remarks	Not relevant
	None

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

Boron trichloride

Annex to the safety data sheet: Exposure scenario

Reference number: EIGA006 CAS-No.: 10294-34-5 Product form: Substance Physical state: Gas

Conditions and measures related to treatment of waste (including article waste)	
See section 13 of the SDS	External treatment and disposal of waste should comply with applicable local and/or national regulations
See section 13 of the SDS	External recovery and recycling of waste should comply with applicable local and/or national regulations
Additional conditions - Environment	Ensure operatives are trained to minimise releases

Other conditions affecting environmental exposure	
Others	Not relevant

2.2.2. Control of worker exposure: PROC1, PROC8b

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
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.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used (or contained in articles), frequency and duration of use/exposure	
Amounts used	No data available
Hours per shift	5 days/week 8 h

Technical and organisational conditions and measures	
See Section 7	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	Transfer of substance or mixture (charging and discharging) at dedicated facilities
Local exhaust ventilation	Transfer of substance or mixture (charging and discharging) at dedicated facilities
inhalation exposure	See Section 7

Conditions and measures related to personal protection, hygiene and health evaluation	
See section 8 of the SDS for more information on personal protective equipment	

Additional conditions - Human health	
Additional conditions - Human health	Ensure supervision is in place to check that the RMMs are in place and are being used correctly and that the OCs are being followed

Other conditions affecting workers exposure	
	Not available

Boron trichloride

Annex to the safety data sheet: Exposure scenario

Reference number: EIGA006 CAS-No.: 10294-34-5 Product form: Substance Physical state: Gas

Others	See section 8 of the SDS.
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2.3. Exposure estimation and reference to its source

2.3.1. Environmental release and exposure: ERC6a

No exposure assessment presented for the environment

2.3.2. Worker exposure: PROC1, PROC8b

No exposure assessment presented for human health

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

2.4.1. Environment

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

2.4.2. 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
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Boron trichloride

Annex to the safety data sheet: Exposure scenario

Reference number: EIGA006 CAS-No.: 10294-34-5 Product form: Substance Physical state: Gas

3. ES0310021839: Industrial uses, closed contained conditions

3.1. Title section

Industrial uses, closed contained conditions

ES Ref.: ES0310021839

Environment	Use descriptors
CS0510021839	ERC6a

Worker	Use descriptors
CS0610021839	PROC1

3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: ERC6a

ERC6a	Use of intermediate
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Product (article) characteristics	
Physical form of product	See section 9 of the SDS.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use (or from service life)	
Regional use tonnage:	No data available.
Batch process	Not relevant
Continuous process	Not relevant

Technical and organisational conditions and measures	
See chapter 8 of the safety data sheet (Environmental exposure controls).	
Technical and organisational measures	Handle substance within a closed system
Air	100 % Air - minimum efficiency of
Soil	Not relevant
Water	100 % Water - minimum efficiency of
Remarks	Not relevant
	None

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

Boron trichloride

Annex to the safety data sheet: Exposure scenario

Reference number: EIGA006 CAS-No.: 10294-34-5 Product form: Substance Physical state: Gas

Conditions and measures related to treatment of waste (including article waste)	
See section 13 of the SDS	External treatment and disposal of waste should comply with applicable local and/or national regulations
See section 13 of the SDS	External recovery and recycling of waste should comply with applicable local and/or national regulations
Additional conditions - Environment	Ensure operatives are trained to minimise releases

Other conditions affecting environmental exposure	
Others	Not relevant

3.2.2. Control of worker exposure: PROC1

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
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Product (article) characteristics	
Physical form of product	See section 9 of the SDS.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used (or contained in articles), frequency and duration of use/exposure	
Amounts used	No data available
Hours per shift	5 days/week 8 h

Technical and organisational conditions and measures	
See Section 7	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
inhalation exposure	See Section 7

Conditions and measures related to personal protection, hygiene and health evaluation	
See section 8 of the SDS for more information on personal protective equipment	

Additional conditions - Human health	
Additional conditions - Human health	Ensure supervision is in place to check that the RMMs are in place and are being used correctly and that the OCs are being followed

Other conditions affecting workers exposure	
	Not available
Others	See section 8 of the SDS.

Boron trichloride

Annex to the safety data sheet: Exposure scenario

Reference number: EIGA006 CAS-No.: 10294-34-5 Product form: Substance Physical state: Gas

3.3. Exposure estimation and reference to its source

3.3.1. Environmental release and exposure: ERC6a

No exposure assessment presented for the environment

3.3.2. Worker exposure: PROC1

No exposure assessment presented for human health

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

3.4.1. Environment

Guidance - Environment	Check that RMMs and OCs are as described above or of equivalent efficiency
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3.4.2. 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
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Boron trichloride

Annex to the safety data sheet: Exposure scenario

Reference number: EIGA006 CAS-No.: 10294-34-5 Product form: Substance Physical state: Gas

4. ES0410021839: Industrial uses, closed contained conditions

4.1. Title section

Industrial uses, closed contained conditions

ES Ref.: ES0410021839

Environment	Use descriptors
CS0710021839	ERC6a

Worker	Use descriptors
CS0810021839	PROC2, PROC3

4.2. Conditions of use affecting exposure

4.2.1. Control of environmental exposure: ERC6a

ERC6a	Use of intermediate
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Product (article) characteristics	
Physical form of product	See section 9 of the SDS.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use (or from service life)	
Regional use tonnage:	No data available.
Batch process	Not relevant
Continuous process	Not relevant

Technical and organisational conditions and measures	
See chapter 8 of the safety data sheet (Environmental exposure controls).	
Technical and organisational measures	Handle substance within a closed system
Air	100 % Air - minimum efficiency of
Soil	Not relevant
Water	100 % Water - minimum efficiency of
Remarks	Not relevant
	None

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

Boron trichloride

Annex to the safety data sheet: Exposure scenario

Reference number: EIGA006 CAS-No.: 10294-34-5 Product form: Substance Physical state: Gas

Conditions and measures related to treatment of waste (including article waste)	
See section 13 of the SDS	External treatment and disposal of waste should comply with applicable local and/or national regulations
See section 13 of the SDS	External recovery and recycling of waste should comply with applicable local and/or national regulations
Additional conditions - Environment	Ensure operatives are trained to minimise releases

Other conditions affecting environmental exposure	
Others	Not relevant

4.2.2. Control of worker exposure: PROC2, PROC3

PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
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.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used (or contained in articles), frequency and duration of use/exposure	
Amounts used	No data available
Hours per shift	5 days/week 8 h

Technical and organisational conditions and measures	
See Section 7	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
Local exhaust ventilation	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
Local exhaust ventilation	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
inhalation exposure	See Section 7

Conditions and measures related to personal protection, hygiene and health evaluation	
See section 8 of the SDS for more information on personal protective equipment	

Boron trichloride

Annex to the safety data sheet: Exposure scenario

Reference number: EIGA006 CAS-No.: 10294-34-5 Product form: Substance Physical state: Gas

Additional conditions - Human health	
Additional conditions - Human health	Ensure supervision is in place to check that the RMMs are in place and are being used correctly and that the OCs are being followed
Other conditions affecting workers exposure	
	Not available
Others	See section 8 of the SDS.

4.3. Exposure estimation and reference to its source

4.3.1. Environmental release and exposure: ERC6a

No exposure assessment presented for the environment

4.3.2. Worker exposure: PROC2, PROC3

No exposure assessment presented for human health

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

4.4.1. Environment

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

4.4.2. 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
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Boron trichloride

Annex to the safety data sheet: Exposure scenario

Reference number: EIGA006 CAS-No.: 10294-34-5 Product form: Substance Physical state: Gas

5. ES0510021839: Industrial uses, closed contained conditions

5.1. Title section

Industrial uses, closed contained conditions

ES Ref.: ES0510021839

Environment	Use descriptors
CS0910021839	ERC6a

Worker	Use descriptors
CS1010021839	PROC1

5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: ERC6a

ERC6a	Use of intermediate
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Product (article) characteristics	
Physical form of product	See section 9 of the SDS.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use (or from service life)	
Regional use tonnage:	No data available.
Batch process	Not relevant
Continuous process	Not relevant

Technical and organisational conditions and measures	
See chapter 8 of the safety data sheet (Environmental exposure controls).	
Technical and organisational measures	Handle substance within a closed system
Air	100 % Air - minimum efficiency of
Soil	Not relevant
Water	100 % Water - minimum efficiency of
Remarks	Not relevant
	None

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

Boron trichloride

Annex to the safety data sheet: Exposure scenario

Reference number: EIGA006 CAS-No.: 10294-34-5 Product form: Substance Physical state: Gas

Conditions and measures related to treatment of waste (including article waste)	
See section 13 of the SDS	External treatment and disposal of waste should comply with applicable local and/or national regulations
See section 13 of the SDS	External recovery and recycling of waste should comply with applicable local and/or national regulations
Additional conditions - Environment	Ensure operatives are trained to minimise releases

Other conditions affecting environmental exposure	
Others	Not relevant

5.2.2. Control of worker exposure: PROC1

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
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Product (article) characteristics	
Physical form of product	See section 9 of the SDS.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used (or contained in articles), frequency and duration of use/exposure	
Amounts used	No data available
Hours per shift	5 days/week 8 h

Technical and organisational conditions and measures	
See Section 7	
Provide a basic standard of general ventilation (1 to 3 air changes per hour).	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
inhalation exposure	See Section 7

Conditions and measures related to personal protection, hygiene and health evaluation	
See section 8 of the SDS for more information on personal protective equipment	

Additional conditions - Human health	
Additional conditions - Human health	Ensure supervision is in place to check that the RMMs are in place and are being used correctly and that the OCs are being followed

Other conditions affecting workers exposure	
	Not available
Others	See section 8 of the SDS.

Boron trichloride

Annex to the safety data sheet: Exposure scenario

Reference number: EIGA006 CAS-No.: 10294-34-5 Product form: Substance Physical state: Gas

5.3. Exposure estimation and reference to its source

5.3.1. Environmental release and exposure: ERC6a

No exposure assessment presented for the environment

5.3.2. Worker exposure: PROC1

No exposure assessment presented for human health

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

5.4.1. Environment

Guidance - Environment	Check that RMMs and OCs are as described above or of equivalent efficiency
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5.4.2. 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
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End of document