



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
Other means of identification	: Boron trichloride 4.0, Material No. 77050172, 77050112 & 77050152; Boron trichloride 5.0, Material No. 77060172, 77060112 & 77060112V24

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. Electronic component manufacture Industrial and professional. Perform risk assessment prior to use. Raw material for pharmaceutical products

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 GmbH Division Gas
Seitnerstr. 70
DE – 82049 Pullach
Germany
T +49 89 74460
info@linde.com

1.4. Emergency telephone number

Emergency number : UMC0/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
	Skin corrosion/irritation, Category 1, Sub-Category 1B	H314
	Serious eye damage/eye irritation, Category 1	H318
	Acute toxicity (inhalation:gas) Category 2	H330
	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) :



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.



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- Response : 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.

2.3. Other hazards

- Other hazards : Not classified as PBT or vPvB. 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]
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) Skin Corr. 1B, H314 Eye Dam. 1, H318 Acute Tox. 2 (Inhalation:gas), H330 (ATE=100 ppmv/4h) 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 □ □ 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.



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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 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. 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 CO2 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.



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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.

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.

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.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

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



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Safe handling of the gas receptacle	<p>: Refer to supplier's container handling instructions.</p> <p>Do not allow backfeed into the container.</p> <p>Protect containers from physical damage; do not drag, roll, slide or drop.</p> <p>When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.</p> <p>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.</p> <p>If user experiences any difficulty operating valve discontinue use and contact supplier.</p> <p>Never attempt to repair or modify container valves or safety relief devices.</p> <p>Damaged valves should be reported immediately to the supplier.</p> <p>Keep container valve outlets clean and free from contaminants particularly oil and water.</p> <p>Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.</p> <p>Close container valve after each use and when empty, even if still connected to equipment.</p> <p>Never attempt to transfer gases from one cylinder/container to another.</p> <p>Never use direct flame or electrical heating devices to raise the pressure of a container.</p> <p>Do not remove or deface labels provided by the supplier for the identification of the content of the container.</p> <p>Suck back of water into the container must be prevented.</p> <p>Open valve slowly to avoid pressure shock.</p>
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7.2. Conditions for safe storage, including any incompatibilities

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

None.

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

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DNEL/DMEL (Workers)

Acute - local effects, inhalation	16 ppm
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Long-term - systemic effects, inhalation	16 mg/m³
Long-term - local effects, inhalation	8 mg/m³
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

8.2.1. 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).

8.2.2. 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):



8.2.2.1. 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



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8.2.2.2. 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.
Chloroprene rubber (Neoprene®) (CR)

Other skin protection

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.

Materials for protective clothing:

8.2.2.3. Respiratory protection

Respiratory protection:

Recommended: Filter B (grey).
Keep self contained breathing apparatus readily available for emergency use.
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.

8.2.2.4. Thermal hazards

Thermal hazard protection:

None in addition to the above sections.

8.2.3. 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.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	
Physical state	: Gas
Colour	: Gives off white fumes in moist air. Colourless.
Form	: Liquefied gas
Appearance	: Water-white to pale yellow liquid.
Odour	: Pungent.
Odour threshold	: Odour threshold is subjective and inadequate to warn of overexposure.
Melting point	: -107 °C
Freezing point	: Not applicable
Boiling point	: 12.5 °C
Flammability	: Non flammable.
Oxidising properties	: No oxidising properties.
Explosive limits	: Not known.



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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	: 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	: 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)
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.

10.4. Conditions to avoid

Avoid moisture in installation systems.

10.3. Possibility of hazardous reactions

Reacts violently with water.

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.



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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 (dermal)	: Not classified
Acute toxicity (inhalation)	: Fatal if inhaled.

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LC50 Inhalation - Rat [ppm]	1270 ppm/4h
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.
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	



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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.
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.

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.



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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

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)	UN 1741 Boron trichloride, 2.3 (8)	UN 1741 BORON TRICHLORIDE, 2.3 (8)	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)
		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



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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
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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
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
Special provisions (ADN)	: 274, 392, 662
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



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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)

Not 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 1005/2009)

VOC Directive (2004/42)

Restrictions on use : None.

Seveso Directive (Disaster Risk Reduction)

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

Explosives Precursors Regulation (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 (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.



Boron trichloride

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

Germany

Employment restrictions	: Observe restrictions according Act on the Protection of Working Mothers (MuSchG). Observe restrictions according Act on the Protection of Young People in Employment (JArbSchG).																									
Water hazard class (WGK)	: Not classified according to Regulation Governing Systems for Handling Substances Hazardous to Waters (AwSV).																									
Storage class (LGK, TRGS 510)	: LGK 2A – Gases (except aerosol dispensers and lighters).																									
Joint storage table	: <table><tr><td>LGK 1</td><td>LGK 2A</td><td>LGK 2B</td><td>LGK 3</td><td>LGK 4.1A</td></tr><tr><td>LGK 4.1B</td><td>LGK 4.2</td><td>LGK 4.3</td><td>LGK 5.1A</td><td>LGK 5.1B</td></tr><tr><td>LGK 5.1C</td><td>LGK 5.2</td><td>LGK 6.1A</td><td>LGK 6.1B</td><td>LGK 6.1C</td></tr><tr><td>LGK 6.1D</td><td>LGK 6.2</td><td>LGK 7</td><td>LGK 8A</td><td>LGK 8B</td></tr><tr><td>LGK 10</td><td>LGK 11</td><td>LGK 12</td><td>LGK 13</td><td>LGK 10-13</td></tr></table>	LGK 1	LGK 2A	LGK 2B	LGK 3	LGK 4.1A	LGK 4.1B	LGK 4.2	LGK 4.3	LGK 5.1A	LGK 5.1B	LGK 5.1C	LGK 5.2	LGK 6.1A	LGK 6.1B	LGK 6.1C	LGK 6.1D	LGK 6.2	LGK 7	LGK 8A	LGK 8B	LGK 10	LGK 11	LGK 12	LGK 13	LGK 10-13
LGK 1	LGK 2A	LGK 2B	LGK 3	LGK 4.1A																						
LGK 4.1B	LGK 4.2	LGK 4.3	LGK 5.1A	LGK 5.1B																						
LGK 5.1C	LGK 5.2	LGK 6.1A	LGK 6.1B	LGK 6.1C																						
LGK 6.1D	LGK 6.2	LGK 7	LGK 8A	LGK 8B																						
LGK 10	LGK 11	LGK 12	LGK 13	LGK 10-13																						
Joint storage not permitted for	: LGK 1, LGK 3, LGK 4.1A, LGK 4.1B, LGK 4.2, LGK 4.3, LGK 5.1A, LGK 5.1B, LGK 5.2, LGK 6.1A, LGK 6.1B, LGK 6.1C, LGK 6.1D, LGK 6.2, LGK 7, LGK 10.																									
Joint storage with restrictions permitted for	: LGK 2A, LGK 2B, LGK 5.1C, LGK 8A, LGK 11, LGK 10–13.																									
Joint storage permitted for	: LGK 8B, LGK 12, LGK 13.																									
Chemicals Prohibition Ordinance (ChemVerbotsV)	: This product is subject to ChemVerbotsV Annex 2 Entry 1. The following requirements must be observed: authorization requirement (according to § 6 paragraph 1 sentence 1), basic requirements for carrying out the delivery (according to § 8 paragraph 1, 3 and 4), identification and documentation (according to § 9 paragraph 1 to 3) and exclusion of the shipping route (according to § 10).																									
Hazardous Incident Ordinance (12. BImSchV)	: Is not subject to the Hazardous Incident Ordinance (12. BImSchV)																									

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:

	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



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Abbreviations and acronyms:

	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

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
EUH014	Reacts violently with water.
EUH071	Corrosive to the respiratory tract.
Eye Dam. 1	Serious eye damage/eye irritation. Category 1
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.
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

Full text of use descriptors

ERC2	Formulation into mixture
ERC6a	Use of intermediate
PC0	Other



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Full text of use descriptors

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
DISCLAIMER OF LIABILITY

: ATP 12
: 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 DE

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.

End of document