

**Safety Data Sheet according to Regulation (EC)
No. 1907/2006 (REACH)**

Printed 10.08.2017
revision 10.08.2017 (GB) Version 8.1

boron trichloride
1900, 70190



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

1.1. Product identifier

Name of product	boron trichloride Art-Nr(n): 1900, 70190
Name of substance	boron-trichloride
Index No	005-002-00-5
EC No	233-658-4
REACH registration number	01-2119962197-29
CAS No	10294-34-5

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

Identified uses

Sector of uses [SU]

SU10 - Formulation [mixing] of preparations and/or re-packaging (excluding alloys).
SU16 - Manufacture of computer, electronic and optical products, electrical equipment
SU24 - Scientific research and development
SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites.
SU9 - Manufacture of fine chemicals

Product categories [PC]

PC19 - Intermediate
PC21 - Laboratory chemicals
PC33 - Semiconductors

Process categories [PROC]

PROC1 - Use in closed process, no likelihood of exposure.
PROC2 - Use in closed, continuous process with occasional controlled exposure.
PROC15 - Use as laboratory reagent

Environmental release categories [ERC]

ERC1 - Manufacture of substances.
ERC9a - Wide dispersive indoor use of substances in closed systems
ERC2 - Formulation of preparations.
ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates).
ERC6b - Industrial use of reactive processing aids.

Recommended intended purpose(s)

Basic substance.
Catalyst.

1.3. Details of the supplier of the safety data sheet

Manufacturer/distributor	GHC Gerling, Holz & Co. Handels GmbH Ruhrstraße 113, D-22761 Hamburg Phone +49 40 853 123-0, Fax +49 40 853 123-66 E-Mail hamburg@ghc.de Internet www.ghc.com
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Advice	GHC Gerling, Holz & Co. Handels GmbH Phone +49 40 853 123-0 Fax +49 40 853 123-66 E-mail (competent person): msds@ghc.de
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1.4. Emergency telephone number

Emergency advice	Giftinformationszentrum (Poison Control Centre) Mainz Phone +49 6131 19240
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**GERLING
HOLZ+CO**



SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Hazard classes and Hazard categories Hazard Statements Classification procedure

Liquef. Gas	H280
Acute Tox. 2	H300
Acute Tox. 2	H330
Skin Corr. 1B	H314
Eye Dam. 1	H318
STOT SE 3	H335

Hazard statements for physical hazards

H280 Contains gas under pressure; may explode if heated.

! Hazard statements for health hazards

H300 + H330 Fatal if swallowed or if inhaled.

H314 Causes severe skin burns and eye damage.

H318 Causes serious eye damage.

H335 May cause respiratory irritation.

Additional hints

Listed substance (Regulation (EC) No 1272/2008, Annex VI, part 3).

2.2. Label elements

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



GHS05



GHS06

Signal word

Danger

Hazard statements for physical hazards

H280 Contains gas under pressure; may explode if heated.

! Hazard statements for health hazards

H300 + H330 Fatal if swallowed or if inhaled.

H314 Causes severe skin burns and eye damage.

H335 May cause respiratory irritation.

Precautionary Statements

Prevention

P260 Do not breathe gas/vapours.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response

P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P315 Get immediate medical advice/attention.

Storage

P403 Store in a well-ventilated place.

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P405 Store locked up.

Hazardous ingredients for labeling
boron-trichloride

Supplemental Hazard information (EU)

Physical properties

Reacts violently with water.

Health properties

Corrosive to the respiratory tract.

2.3. Other hazards

! Information pertaining to special dangers for human and environment

Dangerous substances are released in case of decomposition.

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

Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

SECTION 3: Composition/ information on ingredients

3.1. Substances

CAS No 10294-34-5

boron-trichloride

EC No 233-658-4

Index No 005-002-00-5

REACH registration number 01-2119962197-29

3.2. Mixtures

not applicable

! SECTION 4: First aid measures

4.1. Description of first aid measures

General information

Remove contaminated soaked clothing immediately.

Adhere to personal protective measures when giving first aid.

Seek medical treatment immediately.

In case of inhalation

Remove the casualty into fresh air and keep him immobile.

In case of breathing difficulties give oxygen.

In the event of pulmonary irritation treat initially with corticoid spray, e.g. Ventolair- or Pulmicort- metered-dose aerosol (Ventolair and Pulmicort are registered trademarks).

Seek medical treatment immediately.

In case of respiratory standstill give artificial respiration by respiratory bag (Ambu bag) or respirator. Send for a doctor.

! In case of skin contact

In case of contact with skin wash off immediately with plenty of water.

Seek medical treatment immediately.

In case of eye contact

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Call for a doctor immediately.

In case of ingestion

Ingestion is not considered a potential route of exposure.

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

Physician's information / possible symptoms

Shortness of breath

Physician's information / possible dangers

Risk of pulmonary oedema

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

Treatment (Advice to doctor)

Continue to monitor for pneumonia and pulmonary oedema.

Monitor circulation.

! SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

Product does not burn, fire-extinguishing activities according to surrounding.

Unsuitable extinguishing media

Full water jet

5.2. Special hazards arising from the substance or mixture

In the event of fire the following can be released:

Hydrogen chloride (HCl)

Boric acid (H₃BO₃)

Chlorine (Cl₂)

5.3. Advice for firefighters

Special protective equipment for fire-fighters

Use breathing apparatus with independent air supply (isolated).

Wear full protective clothing.

Additional information

Cool endangered containers with water spray jet.

Exposure to fire may cause containers to rupture / explode.

Fire residues and contaminated firefighting water must be disposed of in accordance with the local regulations.

Collect contaminated firefighting water separately, must not be discharged into the drains.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

See chapter 8.

Remove persons to safety.

Evacuate area.

Keep people away and stay on the upwind side.

For emergency responders

Use personal protective clothing.

Use respiratory protection

6.2. Environmental precautions

Do not discharge into the drains or bodies of water..

Collect contaminated water / firefighting water separately.

If possible, stop flow of product.

Prevent spread (e.g. by saving in a salvage packaging).

Suppress gases/vapours/mists with water spray jet

Do not discharge into the subsoil/soil.

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6.3. Methods and material for containment and cleaning up

Ensure adequate air ventilation.

Additional Information

No water on the leaks.

6.4. Reference to other sections

Safe handling: see section 7

Personal protection equipment: see section 8

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

Use only in thoroughly ventilated areas.

Transfer and handle only in enclosed systems.

Containers' temperature may not be increased above 50 °C.

Do not heat with open flames.

The working pressure in the receptacle must not exceed the saturation vapour pressure of the pure product resulting at a temperature of 50 °C.

Provide good room ventilation even at ground level (vapours are heavier than air).

Prevent cylinders from falling over.

Ensure valve outlet cap nut or plug is correctly fitted.

Ensure valve protection device is correctly fitted.

Open valve slowly to avoid pressure shock.

Use only properly specified equipment which is suitable for this product, its supply pressure and temperature.

Do not allow backfeed into the container.

Suck back of water into the container must be prevented.

Keep valves and fittings free from oil and grease.

No water to valves, flanges and other fittings.

Purging of pipes and valves with inert gases - to avoid: water, solvents.

General protective measures

Do not inhale gases/vapours/aerosols.

Hygiene measures

At work do not eat, drink, smoke or take drugs.

Wash hands before breaks and after work.

Advice on protection against fire and explosion

The product is not combustible.

Pay attention to general rules of internal fire prevention.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Ventilate store-rooms thoroughly.

Use transportable pressure equipment.

Suitable materials: Normalised steel and carbon steel, tempered steel, stainless steel.

Suitable materials: nickel alloys

Suitable materials: austenitic stainless steel

Valve: Suitable materials: Carbon steels, stainless steel.

Valve: Suitable materials: nickel alloys

Unsuitable materials: Aluminium alloys, brass, copper alloys.

Advice on storage compatibility

Do not store with spontaneously flammable materials.

Do not store together with combustible liquids or combustible solids.

Do not store together with animal feedstuffs.

Do not store together with explosives.

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Do not store together with infectious substances.
Do not store together with radioactive material.
Do not store together with toxic liquids or toxic solids.
Do not store together with food.
Do not store together with oxidizing liquids or oxidizing solids.

Further information on storage conditions

Ensure valve protection device is correctly fitted.
Store closed container at cool and aired place.
Store only in original container at temperature of 50 °C maximum (=122 °F).
Keep locked up.
Prevent cylinders from falling over.
Protect from heat/overheating.

7.3. Specific end use(s)**Recommendation(s) for intended use**

Exposure scenarios (ES) see annex to this safety data sheet.

SECTION 8: Exposure controls/personal protection**8.1. Control parameters****Ingredients with occupational exposure limits to be monitored**

CAS No	Name	Code	[mg/m3]	[ppm]	Remark
7647-01-0	Hydrogen chloride	WEL, 8 hours	2	1	EH40, UK
		Short-term	8	5	
7647-01-0	hydrogen chloride	8 hours	8	5	EU
		Short-term	15	10	

DNEL-/PNEC-values**DNEL worker**

CAS No	Substance name	Value	Code	Remark
10294-34-5	boron-trichloride	8 mg/m3	DNEL long-term inhalative (local)	irritation (expiratory trac)
		16 mg/m3	DNEL long-term inhalative (systemic)	repeated dose toxicity.
		16 mg/m3	DNEL acute inhalative (local)	irritation (expiratory trac)

PNEC

CAS No	Substance name	Value	Code	Remark
10294-34-5	boron-trichloride	39 µg/kg	PNEC aquatic, marine water	Assessment factor 10, assessment factor.
		39 µg/l	PNEC sewage treatment plant (STP)	
		16 µg/l	PNEC air	
		39 µg/kg	PNEC sediment, freshwater	Assessment factor 10, assessment factor.
		11 µg/kg	PNEC soil	
		48 µg/l	PNEC aquatic, intermittent release	
		39 µg/l	PNEC aquatic, marine water	

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DNEL-/PNEC-values (continued)

CAS No	Substance name	Value	Code	Remark
		39 µg/l	PNEC aquatic, freshwater	Assessment factor 10, assessment factor.

Additional advice

Product of the hydrolysis.

8.2. Exposure controls

Respiratory protection

Breathing apparatus in the event of high concentrations.
Keep self contained breathing apparatus readily available for emergency use.
Short term: filter apparatus, combination filter B-P3

Hand protection

Leather gloves
Protective gloves complying with EN 374.
Safety gloves according EN 388
In case of increased risk: Protective gloves made of CR.

Eye protection

safety goggles, in case of increased risk add protective face shield

Other protection measures

Safety shoes with steel toe.
Body covering work clothing, or chemical resistant suit at increased risk complying with EN 14605.

Appropriate engineering controls

Transfer and handle only in enclosed systems.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

compressed liquified gas

Colour

colourless

Odour

pungent

Odour threshold

not determined

Important health, safety and environmental information

	Value	Temperature	at	Method	Remark
pH value	not determined				
Acid number	not applicable				
boiling point	12,5 °C			1013 hPa	
melting point	-107 °C				
Flash point	not applicable				
Vapourisation rate	not determined				

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	Value	Temperature	at	Method	Remark
Flammable (solid)	not applicable				
Flammability (gas)	no				
Ignition temperature	no				
Self ignition temperature	no				
Lower explosion limit	no				
Upper explosion limit	no				
Vapour pressure	1598 hPa	20 °C			
Relative density	1,346 g/cm3	12,5 °C			liquid phase
Vapour density	4				air = 1
Solubility in water					hydrolyses
Solubility/other	not determined				
Partition coefficient n-octanol/water (log P O/W)				not applicable	
Decomposition temperature	not determined				
Viscosity dynamic	1,032 mPa*s	10 °C			liquid phase
Oxidising properties	no				
Explosive properties	no				
9.2. Other information					
Product effects hygroscopic.					
In case of warming up in water hydrolyse.					

SECTION 10: Stability and reactivity**10.1. Reactivity**

See section "Possibility of hazardous reactions".

10.2. Chemical stability

Stable under recommended conditions of use and storage (see section 7).

Hydrolyses

10.3. Possibility of hazardous reactions

Reacts violently with water.

Reactions with oxidizing agents.

Reactions with alkalies.

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Reactions with organic substances.
Reactions with damp air.
Reactions with metals, with evolution of hydrogen.

10.4. Conditions to avoid

Heat sources / heat - risk of bursting.
Humidity.

10.5. Incompatible materials

Substances to avoid

Organic substances (fats, oils).
Oxidants.
Water / moisture.
Alkalis.

10.6. Hazardous decomposition products

hydrochloric acid
Boric acid

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity/Irritation/Sensitization

	Value/Validation	Species	Method	Remark
LD50 acute oral	not applicable			
LC50 acute inhalation	2541 ppm (1 h)	Rat (male)		
Skin irritation	corrosive	rabbit		
Eye irritation	corrosive			experiences
Skin sensitization	non-sensitizing			
Sensitization respiratory system		not determined		

Subacute Toxicity - Carcinogenicity

	Value	Species	Method	Validation
Mutagenicity				No experimental information on genotoxicity in vitro and in vivo available.
Reproduction-Toxicity	NOAEC 340 mg/m3 Inhalation.			Impairments caused by the product are not to be expected.

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Value	Species	Method	Validation
Carcinogenicity			No indications of carcinogenic effects are available from long-term trials.
Specific target organ toxicity (single exposure) May cause respiratory irritation.			
Specific target organ toxicity (repeated exposure) Substance or mixture is not classified in GHS-criteria as specific target organ toxic with repeated exposure.			
Aspiration hazard Not applicable for gases and gas mixtures			
Experiences made from practice Risk of strong health injuries in case of long-term exposition. Irritates respiratory tract. Irritates mucous membranes.			

SECTION 12: Ecological information**12.1. Toxicity****Ecotoxicological effects**

Value	Species	Method	Validation
Fish			The product hydrolyses.

12.2. Persistence and degradability

Elimination rate	Method of analysis	Method	Validation
Physico-chemical degradability The product is not stable and hydrolyses.			

12.3. Bioaccumulative potential

Bioaccumulation improbable.

12.4. Mobility in soil

Adsorption in the soil is not likely.

12.5. Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

12.6. Other adverse effects**General regulation**

The product hydrolyses.

Do not allow uncontrolled leakage of product into the environment.

Product is not allowed to be discharged into the ground water or aquatic environment.

Product is not allowed to be discharged into aquatic environment, drains or sewage treatment plants.

SECTION 13: Disposal considerations**13.1. Waste treatment methods****Waste code No.**

16 05 04*

Name of waste

gases in pressure containers (including halons) containing hazardous substances

Wastes marked with an asterisk are considered to be hazardous waste pursuant to Directive 2008/98/EC on hazardous waste.

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**Recommendations for the product**

Dispose of as hazardous waste.

Recommendations for packaging

Transportable pressure equipment (empty, residual pressure): Return to supplier / manufacturer.

SECTION 14: Transport information

	ADR/RID	IMDG	IATA-DGR
14.1. UN number	1741	1741	1741
14.2. UN proper shipping name	BORON TRICHLORIDE	BORON TRICHLORIDE	Boron trichloride
14.3. Transport hazard class(es)	2.3 (8)	2.3 (8)	2.3 (8)
14.4. Packing group	-	-	-
14.5. Environmental hazards	No	No	No

14.6. Special precautions for user

The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

not applicable

No transport as bulk according IBC - Code.

Land and inland navigation transport ADR/RID

Hazard label(s) 2.3+8

tunnel restriction code C/D

Classification code 2TC

Marine transport IMDG

Ems: F-C, S-U

Air transport ICAO/IATA-DGR

FORBIDDEN

SECTION 15: Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****Other regulations (EU)**

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances.

15.2. Chemical Safety Assessment

Exposure scenarios (ES) see annex to this safety data sheet.

SECTION 16: Other information**Recommended uses and restrictions**

National and local regulations concerning chemicals shall be observed.

Further information

All declarations of safety-data-sheet refer to pure substance.

The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

Indication of changes: "I" = Data changed compared with the previous version. Previous version: 8.0

Identified uses:

Use: Manufacturing and on-site use

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites

SU 3, SU9: Industrial uses: Uses of substances as such or in preparations at industrial sites, Manufacture of fine chemicals

PROC1: Use in closed process, no likelihood of exposure
--

ERC1: Manufacture of substances
--

Use: Formulation of preparations

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites

SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
--

PROC1: Use in closed process, no likelihood of exposure
--

ERC2: Formulation of preparations
--

Use: Industrial use of processing aids in processes and products, not becoming part of articles

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites

SU9, SU16: Manufacture of fine chemicals, Manufacture of computer, electronic and optical products, electrical equipment

PC33: Semiconductors

PROC1: Use in closed process, no likelihood of exposure
--

ERC6b: Industrial use of reactive processing aids
--

Use: Used as chemical intermediate

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites

SU9, SU16, SU24: Manufacture of fine chemicals, Manufacture of computer, electronic and optical products, electrical equipment, Scientific research and development
--

PC19: Intermediate

PROC1: Use in closed process, no likelihood of exposure
--

PROC2: Use in closed, continuous process with occasional controlled exposure

ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

Use: Used as laboratory reagent

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites

SU24: Scientific research and development
--

PC21: Laboratory chemicals

PROC15: Use as laboratory reagent
--

ERC9a: Wide dispersive indoor use of substances in closed systems
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1. Short title of Exposure Scenario: Manufacturing and on-site use

Main User Groups	: SU 3
Sectors of end-use	: SU 3, SU9
Process categories	: PROC1
Environmental Release Categories	: ERC1:

2. Exposure scenario**2.1 Contributing scenario controlling environmental exposure for: ERC1****Product characteristics**

Concentration of the Substance in Mixture/Article	: Covers the percentage of the substance in the product up to 100 % (unless stated differently).
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2.2 Contributing scenario controlling worker exposure for: PROC1**Product characteristics**

Concentration of the Substance in Mixture/Article	: Covers the percentage of the substance in the product up to 100 % (unless stated differently).
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Physical Form (at time of use) : Compressed gas

Frequency and duration of use

Application duration : > 4 h

Frequency of use : 220 days/year

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

Use only in area provided with appropriate exhaust ventilation., Good work practice required., Handle substance within a closed system.

Organisational measures to prevent /limit releases, dispersion and exposure

Ensure operatives are trained to minimise exposures.

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

Use suitable eye protection and gloves., For personal protection see section 8.

3. Exposure estimation and reference to its source**Environment**

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC1	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	0,342 g/m ³	0,043

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

1. Short title of Exposure Scenario: Formulation of preparations

Main User Groups : SU 3
 Sectors of end-use : SU 10
 Process categories : PROC1
 Environmental Release Categories : ERC2:

2. Exposure scenario**2.1 Contributing scenario controlling environmental exposure for: ERC2****Product characteristics**

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.2 Contributing scenario controlling worker exposure for: PROC1**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
 Physical Form (at time of use) : Compressed gas

Frequency and duration of use

Application duration : > 4 h
Frequency of use : 220 days/year

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

Use only in area provided with appropriate exhaust ventilation., Good work practice required., Handle substance within a closed system.

Organisational measures to prevent /limit releases, dispersion and exposure

Ensure operatives are trained to minimise exposures.

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

Use suitable eye protection and gloves., For personal protection see section 8.

3. Exposure estimation and reference to its source**Environment**

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC1	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	0,342 mg/m ³	0,043

*Risk characterisation ratio

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1. Short title of Exposure Scenario: Industrial use of processing aids in processes and products, not becoming part of articles

Main User Groups : SU 3
Sectors of end-use : SU9, SU16
Chemical product category : PC33
Process categories : PROC1
Environmental Release Categories : ERC6b:

2. Exposure scenario**2.1 Contributing scenario controlling environmental exposure for: ERC6b****Product characteristics**

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.2 Contributing scenario controlling worker exposure for: PROC1, PC33**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Compressed gas

Frequency and duration of use

Application duration : > 4 h
Frequency of use : 220 days/year

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

Use only in area provided with appropriate exhaust ventilation., Good work practice required., Handle substance within a closed system.

Organisational measures to prevent /limit releases, dispersion and exposure

Ensure operatives are trained to minimise exposures.

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

Use suitable eye protection and gloves., For personal protection see section 8.

3. Exposure estimation and reference to its source**Environment**

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC1	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	0,342 mg/m ³	0,043

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

1. Short title of Exposure Scenario: Used as chemical intermediate

Main User Groups : SU 3
Sectors of end-use : SU9, SU16, SU24
Chemical product category : PC19
Process categories : PROC1, PROC2
Environmental Release Categories : ERC6a:

2. Exposure scenario**2.1 Contributing scenario controlling environmental exposure for: ERC6a****Product characteristics**

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PC19**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Compressed gas

Frequency and duration of use

Application duration : > 4 h
Frequency of use : 220 days/year

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

Use only in area provided with appropriate exhaust ventilation., Good work practice required., Handle substance within a closed system.

Organisational measures to prevent /limit releases, dispersion and exposure

Ensure operatives are trained to minimise exposures.

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

Use suitable eye protection and gloves., For personal protection see section 8.

3. Exposure estimation and reference to its source**Environment**

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC1	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	0,342 mg/m ³	0,043
PROC2	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	3,662 mg/m ³	0,458

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

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1. Short title of Exposure Scenario: Used as laboratory reagent

Main User Groups : SU 3
Sectors of end-use : SU24
Chemical product category : PC21
Process categories : PROC15
Environmental Release Categories : ERC9a:

2. Exposure scenario**2.1 Contributing scenario controlling environmental exposure for: ERC9a****Product characteristics**

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 25 %.

2.2 Contributing scenario controlling worker exposure for: PROC15, PC21**Product characteristics**

Concentration of the Substance in : Covers the percentage of the substance in the product up to 25

Boron trichloride

1900, 70190

Mixture/Article

Physical Form (at time of use) : Compressed gas

Frequency and duration of use

Application duration : 0,25 - 1 h

Frequency of use : 220 days/year

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

Use only in area provided with appropriate exhaust ventilation., Good work practice required.

Organisational measures to prevent /limit releases, dispersion and exposure

Ensure operatives are trained to minimise exposures.

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

Use suitable eye protection and gloves., For personal protection see section 8., Respirator with a full face mask

3. Exposure estimation and reference to its source**Environment**

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC15	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	0,439 mg/m ³	0,055

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).