

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

Product identifier

Name of the substance	Boron trichloride
Trade name of the substance	Trona® Boron Trichloride
Identification Number	005-002-00-5
Registration number	-
Synonyms	None.
Product code	Boron Trichloride
Date of first issue	04-September-2009
Version number	01
Revision date	-
Supersedes date	-

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

Identified uses	Chemical intermediate
Uses advised against	None known.

Details of the supplier of the safety data sheet

Company name	Tronox Pigments (Holland) BV Prof. Gerbrandyweg 2 3197KK Rotterdam-Botlek The Netherlands ChemProdSteward@tronox.com
Telephone	+31 181 246600
Emergency	CHEMTREC 1-760-476-3961 (Access code: 333318)
SDS number	B-5001

Section 2: Hazards identification

Classification of the substance or mixture

The substance has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

Classification according to Directive 67/548/EEC or 1999/45/EC as amended

Classification R14, T+;R26/28, C;R34

Classification according to Regulation (EC) No 1272/2008 as amended

Physical hazards

Gases under pressure	Compressed gas	Contains gas under pressure; may explode if heated.
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Health hazards

Acute toxicity, oral	Category 2	Fatal if swallowed.
Acute toxicity, inhalation	Category 2	Fatal if inhaled.
Skin corrosion/irritation	Category 1B	Causes severe skin burns and eye damage.

Hazard summary

Physical hazards

Reacts violently with water.

Health hazards

Very toxic by inhalation and if swallowed. Causes burns.

Environmental hazards

Not classified for hazards to the environment.

Specific hazards

Causes skin and eye burns. This material is a gas under normal atmospheric conditions and ingestion is unlikely. However: Causes digestive tract burns. Can cause severe respiratory irritation. May cause lung oedema. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling. May cause damage to the liver and kidneys. Boron: High doses have demonstrated effects on fertility, testes, and developmental effects on the fetus in laboratory animals. Relevance of these findings to humans is uncertain.

Main symptoms

Contact with this material will cause burns to the skin, eyes and mucous membranes. Cough, Shortness of breath, Headache, Nausea, Vomiting. Swallowing may cause nausea; vomiting or diarrhea of blue-green materials are common and may be accompanied by dark blood. Be aware that symptoms of lung oedema (shortness of breath) may develop up to 24 hours after exposure.

Label elements**Label according to Regulation (EC) No. 1272/2008 as amended**

Contains: Boron trichloride

Identification Number 005-002-00-5



Signal word Danger

Hazard statements Contains gas under pressure; may explode if heated. Fatal if inhaled. Fatal if swallowed. Causes severe skin burns and eye damage.

Precautionary statements

Prevention Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Do not breathe gas. Use only outdoors or in a well-ventilated area. Wear respiratory protection. Wear protective gloves/protective clothing/eye protection/face protection.

Response IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Rinse mouth. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.

Storage Protect from sunlight. Store in a well-ventilated place. Keep container tightly closed. Keep locked-up.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Supplemental label information Reacts violently with water.

Other hazards None known.

Section 3: Composition/information on ingredients**Substance****General information**

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	INDEX No.	Notes
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Boron trichloride	99.95	10294-34-5 233-658-4	-	005-002-00-5	
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Classification: **DSD:** R14, T+;R26/28, C;R34

CLP: Press. Gas;H280, Acute Tox. 2;H300, Skin Corr. 1B;H314, Acute Tox. 2;H330

DSD: Directive 67/548/EEC.

CLP: Regulation No. 1272/2008.

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. The full text for all R- and H-phrases is displayed in section 16.

Section 4: First aid measures**General information**

Chemical burns must be treated by a physician. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital.

Description of first aid measures

Inhalation Move injured person into fresh air and keep person calm under observation. For breathing difficulties, oxygen may be necessary. Get medical attention immediately. If breathing stops, provide artificial respiration.

Skin contact Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Frostbite: Do not remove clothes, but flush with copious amounts of lukewarm water. Call an ambulance and continue to flush during transportation to hospital.

Eye contact	Flush thoroughly with water for at least 15 minutes. Get immediate medical assistance. If medical assistance is not immediately available, flush an additional 15 minutes. If frostbite occurs, immediately flush eyes with plenty of warm water (not exceeding 105°F/41°C) for at least 15 minutes. If easy to do, remove contact lenses.
Ingestion	This material is a gas under normal atmospheric conditions and ingestion is unlikely. If ingestion occurs: Call a physician or poison control center immediately. DO NOT induce vomiting. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person. If vomiting occurs, keep head lower than the hips to help prevent aspiration.
Most important symptoms and effects, both acute and delayed	Contact with this material will cause burns to the skin, eyes and mucous membranes. Cough, Shortness of breath, Headache, Nausea, Vomiting. Swallowing may cause nausea; vomiting or diarrhea of blue-green materials are common and may be accompanied by dark blood.
Indication of any immediate medical attention and special treatment needed	Be aware that symptoms of lung oedema (shortness of breath) may develop up to 24 hours after exposure. Inhalation may result in delayed onset of dyspnea, chest pain, and pulmonary edema. Be alert to kidney involvement due to boron toxicity and concentration effects during excretion.

Section 5: Firefighting measures

General fire hazards	Containers can burst violently when heated, due to excess pressure build-up.
Extinguishing media	
Suitable extinguishing media	Carbon dioxide or dry powder.
Unsuitable extinguishing media	Reacts with water. Do not use water jet as an extinguisher, as this will spread the fire.
Special hazards arising from the substance or mixture	Hydrogen chloride gas. Chlorine. Boron oxides.
Advice for firefighters	
Special protective equipment for firefighters	In case of contact with water used for fire extinguishing, use chemical resistant protective suit.
Special firefighting procedures	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. ALWAYS stay away from tanks engulfed in flame. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. Move containers from fire area if you can do so without risk. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Section 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures	
For non-emergency personnel	If leakage cannot be stopped, evacuate area. Stay upwind. Ventilate closed spaces before entering. Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). DO NOT touch spilled material. Avoid contact with cold gas. Avoid inhalation and contact with skin and eyes. In aqueous solution: Avoid contact with spilled material. Ensure suitable personal protection (including respiratory protection) during removal of spillages in a confined area. See Section 8 for personal protective equipment.
For emergency responders	Keep unnecessary personnel away. Use personal protection recommended in Section 8 of the SDS.
Environmental precautions	Stop leak if possible without any risk. Sewers must be covered and basements and workpits evacuated. Contact local authorities in case of spillage to drain/aquatic environment. In aqueous solution: Avoid release to the environment. Do not contaminate water.
Methods and material for containment and cleaning up	Ventilate well, stop flow of gas or liquid if possible. Remove ignition sources. Do not allow chemical to enter confined spaces such as sewers due to explosion risk. Sewers designed to preclude formation of explosive concentrations of vapour may be permitted. Use water spray to reduce vapours or divert vapour cloud drift. Do not put water directly on leak, spill area or inside container. Allow gas to dissipate into the atmosphere. vapour can be controlled using a water fog. Water used for control of vapor may become corrosive or toxic and should be contained properly for later disposal. Small Spills: In aqueous solution: Absorb spillage with non-combustible, absorbent material. Shovel up and place in a non-metal waste container for later disposal. Neutralize spill area and wash with plenty of water. Large Spills: Dike flow of spilled material using soil or sandbags. Isolate area until gas has dispersed.
Reference to other sections	See Section 8 for personal protective equipment. For waste disposal, see Section 13.

Section 7: Handling and storage

Precautions for safe handling	Use only with adequate ventilation. Avoid any exposure. Open valve slowly. Secure that cylinders are not exposed to heat. Immediately change contaminated clothes. When using, do not eat, drink or smoke. Do not pressurize, cut, weld, braze, solder, drill, grind or expose empty containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode and cause injury or death. Wear approved safety goggles. Wear protective gloves and appropriate clothing to prevent skin contact. See Section 8 for personal protective equipment. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Compressed gas storage. Store in a cool and well-ventilated place. Secure cylinders in an upright position at all times, close all valves when not in use. Secure cylinders from falling or being knocked over.
Specific end use(s)	Chemical intermediate

Section 8: Exposure controls/personal protection

Control parameters

Occupational exposure limits	No exposure limits noted for the ingredient(s).
Biological limit values	No biological exposure limits noted for the ingredient(s).
Recommended monitoring procedures	Follow standard monitoring procedures.
DNEL	Not available.
PNEC	Not available.

Exposure controls

Appropriate engineering controls	Provide adequate general and local exhaust ventilation. Eye wash facilities and emergency shower must be available when handling this product.
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Individual protection measures, such as personal protective equipment

General information	Personal protective equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.
Eye/face protection	Wear approved chemical safety goggles. Gas-proof goggles are recommended.
Skin protection	
- Hand protection	Risk of contact: Wear cold insulating gloves. Suitable gloves can be recommended by the glove supplier.
- Other	Wear appropriate chemical resistant clothing to prevent any possibility of skin contact.
Respiratory protection	Wear suitable respiratory protection. Respirator type: Chemical respirator with specific cartridge and full facepiece providing protection against the compound of concern. Seek advice from local supervisor.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.

Hygiene measures	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Observe any medical surveillance requirements.
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Environmental exposure controls	Environmental manager must be informed of all significant spillages.
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Section 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Compressed liquefied gas.
Physical state	Gas.
Form	Compressed gas.
Colour	Clear.
Odour	Pungent.
Melting point/freezing point	-107 °C (-160.6 °F)
Boiling point, initial boiling point, and boiling range	12.4 °C (54.3 °F)
Flammability (solid, gas)	Not available.
Oxidising properties	Not applicable.
Explosive properties	Not applicable.
Relative density	1.43 @ 20 °C
Solubility (water)	Decomposes
Bulk density	89 lb/ft ³

Other data

Dynamic viscosity	1.032 mPa.s
Dynamic viscosity temp	10 °C (50 °F)
Molecular formula	B-Cl ₃
Molecular weight	117.19 g/mol

Other information No relevant additional information available.

Section 10: Stability and reactivity

Reactivity	Material reacts with water.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Reacts vigorously with water, liberating heat and forming hydrochloric acid and boric acid. Reacts with moist air, producing hydrochloric acid fumes and boric acid.
Conditions to avoid	Heat, sparks, flames, elevated temperatures. Do not allow water to get into container because of violent heat release reaction.
Incompatible materials	Because of its tendency to form hydrochloric acid, the material should be kept away from: Alcohols. Alkalies. Amines. Fats, grease. Organic material. Strong oxidising agents. Water.
Hazardous decomposition products	Hydrogen chloride gas. Chlorine. Boron oxides.

Section 11: Toxicological information

General information Corrosive. Contact with compressed gas can cause damage (frostbite) due to rapid evaporative cooling.

Information on likely routes of exposure

Ingestion	Fatal if swallowed. This material is a gas under normal atmospheric conditions and ingestion is unlikely. However: Causes digestive tract burns.
Inhalation	Fatal if inhaled. Can cause severe respiratory irritation. May cause lung oedema.
Skin contact	May cause serious chemical burns to the skin.
Eye contact	Causes severe eye burns. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.

Symptoms Contact with this material will cause burns to the skin, eyes and mucous membranes. Cough, Shortness of breath, Headache, Nausea, Vomiting. Swallowing may cause nausea; vomiting or diarrhea of blue-green materials are common and may be accompanied by dark blood.

Information on toxicological effects

Acute toxicity Fatal if inhaled. Fatal if swallowed. Causes skin, eye and digestive tract burns. Causes severe respiratory tract irritation.

Product**Test results**

Boron trichloride (10294-34-5)

Acute Inhalation LC50 Rat: 2541 ppm 1 hours

Skin corrosion/irritation	Causes skin burns.
Serious eye damage/eye irritation	Causes severe eye burns.
Respiratory sensitisation	Not available.
Skin sensitisation	Not a skin sensitiser.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.
Reproductive toxicity	Boron: High doses have demonstrated effects on fertility, testes, and developmental effects on the fetus in laboratory animals. Relevance of these findings to humans is uncertain.
Specific target organ toxicity - single exposure	May cause damage to organs . Respiratory system.
Specific target organ toxicity - repeated exposure	No data available.
Aspiration hazard	No data available.
Mixture versus substance information	Not available.
Other information	Be aware that symptoms of lung oedema (shortness of breath) may develop up to 24 hours after exposure. May cause damage to the kidneys.

Section 12: Ecological information

Toxicity No toxicity data noted for the ingredient(s).

Persistence and degradability	Expected to degrade rapidly in water due to hydrolysis.
Bioaccumulative potential	The product is not expected to bioaccumulate.
Mobility	The product reacts with water and will generate heat.
Environmental fate - Partition coefficient	Not available.
Mobility in soil	Not available.
Results of PBT and vPvB assessment	Not available.
Other adverse effects	In aqueous solution: Substantial amounts of the product may lead to a local change in acidity in small water systems which may have adverse effects on aquatic organisms.

Section 13: Disposal considerations

Waste treatment methods	
Residual waste	Dispose in accordance with applicable federal, state, and local regulations.
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied.
EU waste code	16 05 04* Waste codes should be assigned by the user based on the application for which the product was used.
Disposal methods/information	The packaging should be collected for reuse. Dispose of this material and its container to hazardous or special waste collection point. Dispose in accordance with all applicable regulations.

Section 14: Transport information

ADR

UN number	UN1741
UN proper shipping name	BORON TRICHLORIDE
Transport hazard class(es)	2.3
Subsidiary class(es)	-
Environmental hazards	No
Tunnel restriction code	C/D
Labels required	2.3 +8
Special precautions for user	Not available.

RID

UN number	UN1741
UN proper shipping name	BORON TRICHLORIDE
Transport hazard class(es)	2.3
Subsidiary class(es)	-
Environmental hazards	No
Labels required	2.3+8
Special precautions for user	Not available.

ADN

UN number	UN1741
UN proper shipping name	Boron Trichloride
Transport hazard class(es)	2
Subsidiary class(es)	-
Environmental hazards	No
Labels required	2.3+8
Special precautions for user	Not available.

IATA

UN number	UN1741
UN proper shipping name	Boron trichloride
Transport hazard class(es)	2.3
Subsidiary class(es)	8
Environmental hazards	No
ERG Code	2CP
Special precautions for user	Not available.

IMDG

UN number	UN1741
UN proper shipping name	BORON TRICHLORIDE
Transport hazard class(es)	2.3
Subsidiary class(es)	8

Marine pollutant	No
EmS No.	F-C, S-U
Special precautions for user	Not available.
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	No information available.

Section 15: Regulatory information

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

EU Regulations

Regulation (EC) No. 2037/2000 on substances that deplete the ozone layer, Annex I

Not listed.

Regulation (EC) No. 2037/2000 on substances that deplete the ozone layer, Annex II

Not listed.

Regulation (EC) No. 850/2004 on persistent organic pollutants, Annex I

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 1

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 2

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 3

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex V

Not listed.

Directive 96/61/EC concerning integrated pollution prevention and control (IPPC): Article 15, European Pollution Emission Registry (EPER)

Boron trichloride (CAS 10294-34-5)

Regulation (EC) No. 1907/2006, REACH Article 59(1). Candidate List

Not listed.

Other regulations

The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended and respective national laws implementing EC directives. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006. Young people under 18 years old are not allowed to work with this product according to EU Directive 94/33/EC on the protection of young people at work.

National regulations

Follow national regulation for work with chemical agents.

Chemical safety assessment

No Chemical Safety Assessment has been carried out.

Section 16: Other information

List of abbreviations

DNEL: Derived No-Effect Level.
 PNEC: Predicted No-Effect Concentration.
 PBT: Persistent, bioaccumulative and toxic.
 vPvB: Very Persistent and very Bioaccumulative.

References

IARC Monographs. Overall Evaluation of Carcinogenicity (Volumes 1-100A)
 RTECS (2009)
 IUCLID (2000)

Information on evaluation method leading to the classification of mixture

Not available.

Full text of any statements or R-phrases and H-phrases under Sections 2 to 15

R14 Reacts violently with water.
 R26/28 Very toxic by inhalation and if swallowed.
 R34 Causes burns.
 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.

Training information

Follow training instructions when handling this material.

Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available.

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