Safety Data Sheet

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product identifier

Product Name • **Boron Trichloride (0.5 - 5.0%), Hydrogen (Balance)**

Product Code • 90083

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

Relevant identified use(s) • Semiconductor Manufacture

1.3 Details of the supplier of the safety data sheet

Manufacturer • Air Liquide

2700 Post Oak Blvd.
Houston, TX 77056
United States
www.us.airliquide.com
sds@airliquide.com

Telephone (Technical) • 713-896-2896

Telephone (Technical) • 800-819-1704

1.4 Emergency telephone number

Manufacturer • 800-424-9300 - CHEMTREC

Manufacturer • +1 703-527-3887 - Outside United States

Section 2: Hazards Identification

EU/EEC

According to EU Directive 1272/2008 (CLP)/REACH 1907/2006 [amended by 453/2010]
According to EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)

2.1 Classification of the substance or mixture

CLP • Flammable Gases 1 - H220
Compressed Gas - H280
Skin Corrosion 1B - H314
Serious Eye Damage 1 - H318
Acute Toxicity Inhalation 3 - H331

DSD/DPD • Extremely Flammable (F+)
Very Toxic (T+)
Corrosive (C)
R12, R34, R26

2.2 Label Elements

CLP

DANGER

Hazard statements

- H220 - Extremely flammable gas
- H280 - Contains gas under pressure; may explode if heated
- H314 - Causes severe skin burns and eye damage
- H318 - Causes serious eye damage
- H331 - Toxic if inhaled

Precautionary statements

Prevention

- P210 - Keep away from heat, sparks, open flames and/or hot surfaces. - No smoking.
- P232 - Protect from moisture.
- P260 - Do not breathe gas.
- P264 - Wash thoroughly after handling.
- P270 - Do not eat, drink or smoke when using this product.
- P271 - Use only outdoors or in a well-ventilated area.
- P280 - Wear protective gloves/protective clothing/eye protection/face protection.

Response

- P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
- P381 - Eliminate all ignition sources if safe to do so.
- P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P311 - Call a POISON CENTER or doctor/physician.
- P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P321 - Specific treatment, see supplemental first aid information.
- P363 - Wash contaminated clothing before reuse.
- P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Storage/Disposal

- P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
- P405 - Store locked up.
- P501 - Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

DSD/DPD

Risk phrases

- R12 - Extremely flammable.
- R26 - Very toxic by inhalation.
- R34 - Causes burns.

Safety phrases

- S9 - Keep container in a well ventilated place
- S16 - Keep away from sources of ignition - No Smoking.
- S28 - After contact with skin, wash immediately with plenty of soap and water.
- S36 - Wear suitable protective clothing.
- S37 - Wear suitable gloves.
- S39 - Wear eye/face protection.
- S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

2.3 Other Hazards

CLP

- This material contains Boron Trichloride which reacts violently with water. According to Regulation (EC) No. 1272/2008 (CLP) this material is considered hazardous.

DSD/DPD

- This material contains Boron Trichloride which reacts violently with water. According to European Directive 1999/45/EC this preparation is considered dangerous.

United States (US)

According to OSHA 29 CFR 1910.1200 HCS

2.1 Classification of the substance or mixture

OSHA HCS 2012

- Flammable Gases 1 - H220
  Compressed Gas - H280
  Skin Corrosion 1B - H314
  Serious Eye Damage 1 - H318
  Acute Toxicity Inhalation 3 - H331

2.2 Label elements

OSHA HCS 2012

DANGER

Hazard statements

- Extremely flammable gas - H220
  Contains gas under pressure; may explode if heated - H280
  Causes severe skin burns and eye damage - H314
  Causes serious eye damage - H318
  Toxic if inhaled - H331

Precautionary statements

Prevention

- Keep away from heat, sparks, open flames and/or hot surfaces. - No smoking. - P210
  Protect from moisture. - P232
  Do not breathe gas. - P260
  Wash thoroughly after handling. - P264
  Use only outdoors or in a well-ventilated area. - P271
  Wear protective gloves/protective clothing/eye protection/face protection. - P280

Response

- Leaking gas fire: Do not extinguish, unless leak can be stopped safely. - P377
  Eliminate all ignition sources if safe to do so. - P381
  IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. - P304+P340
  Call a POISON CENTER or doctor/physician. - P311
  IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. - P303+P361+P353
  Specific treatment, see supplemental first aid information. - P321
  Wash contaminated clothing before reuse. - P363
  IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. - P305+P351+P338
  Immediately call a POISON CENTER or doctor/physician. - P310

Storage/Disposal

- Store in a well-ventilated place. Keep container tightly closed. - P403+P233
  Store locked up. - P405
  Dispose of content and/or container in accordance with local, regional, national, and/or international regulations. - P501

2.3 Other hazards

OSHA HCS 2012

- This material contains Boron Trichloride which reacts violently with water. Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

Canada

According to WHMIS

2.1 Classification of the substance or mixture

WHMIS

- Compressed Gas - A
  Flammable Gases - B1
  Very Toxic - D1A
  Corrosive - E

2.2 Label elements

WHMIS

- Compressed Gas - A
  Flammable Gases - B1
  Very Toxic - D1A
  Corrosive - E

2.3 Other hazards

WHMIS

- This material contains Boron Trichloride which reacts violently with water.
  In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

2.4 Other information

NFPA

Section 3 - Composition/Information on Ingredients

3.1 Substances

- Material does not meet the criteria of a substance in accordance with Regulation (EC) No 1272/2008.

3.2 Mixtures

Hazardous Components					
Chemical Name	**Identifiers**	**%(weight)**	**LD50/LC50**	**Classifications According to Regulation/Directive**	**Comments**
Hydrogen	**CAS:**1333-74-0 **EC Number:**215-605-7	95% TO 99.5%	NDA	**EU DSD/DPD:** Annex I - F+; R12 **EU CLP:** Annex VI - Flam. Gas 1, H220 Press. Gas **OSHA HCS 2012:** Flam. Gas 1, Press. Gas - Comp.	Balance
Boron trichloride	**CAS:**10294-34-5 **EC Number:**233-658-4	0.5% TO 5%	Inhalation-Rat LC50 • 2541 ppm 1 Hour(s)	**EU DSD/DPD:** Annex I - R14 T+; R26/28 C; R34 **EU CLP:** Annex VI - Press. Gas- Comp H280; Acute Tox. 2 *, H330; Acute Tox. 2 *, H300; Skin Corr. 1B, H314; EUH014 **OSHA HCS 2012:** Press. Gas - Comp.; Skin Corr. 1B; Eye Dam. 1; Acute Tox 3 (inhl); HNOC - Reacts violently with water	NDA

See Section 16 for full text of H-statements and R-phrases.

Section 4 - First Aid Measures

4.1 Description of first aid measures

Inhalation
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. If signs/symptoms continue, get medical attention.

Skin
- Although exposure is unlikely, in case of contact immediately flush skin with running water. If skin irritation develops get medical advice/attention.

Eye
- Get medical attention if symptoms occur. Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first five minutes, then continue rinsing eye.

Ingestion
- As this product is a gas, refer to the inhalation section.

4.2 Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to Physician
- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

4.4 Other information

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO GASES WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn. Victim(s) who experience any adverse effect after over-exposure to this gas mixture must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

Section 5 - Firefighting Measures

5.1 Extinguishing media

Suitable Extinguishing Media
- Dry chemical or CO2.

Unsuitable Extinguishing Media
- Water

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards
- EXTREMELY FLAMMABLE
Will form explosive mixtures with air.
Vapors may travel to source of ignition and flash back.
Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
Containers may explode when heated.
Ruptured cylinders may rocket.
TOXIC; may be fatal if inhaled.
Vapors are extremely irritating and corrosive.
May react violently with water and produce toxic gas.

Hazardous Combustion Products
- No data available

5.3 Advice for firefighters

- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
Wear positive pressure self-contained breathing apparatus (SCBA).
DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED
Move containers from fire area if you can do it without risk.
FIRE: If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all

directions.
FIRE INVOLVING TANKS: ALWAYS stay away from tanks engulfed in fire.
FIRE INVOLVING TANKS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
FIRE INVOLVING TANKS: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
FIRE INVOLVING TANKS: Cool containers with flooding quantities of water until well after fire is out.
FIRE INVOLVING TANKS: Do not direct water at source of leak or safety devices; icing may occur.
FIRE INVOLVING TANKS: For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
LARGE FIRES: Do not get water inside containers.
LARGE FIRES: Damaged cylinders should be handled only by specialists.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal Precautions

- Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not touch or walk through spilled material. Ventilate the area before entry.

Emergency Procedures

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area) As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. Stop leak if you can do it without risk. Keep unauthorized personnel away. Keep out of low areas. Stay upwind. LARGE SPILL: Consider initial downwind evacuation for at least 800 meters (1/2 mile) Isolate area until gas has dispersed.

6.2 Environmental precautions

- Prevent spreading of vapors through sewers, ventilation systems and confined areas.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures

- All equipment used when handling the product must be grounded.
Stop leak if you can do it without risk.
If possible, turn leaking containers so that gas escapes rather than liquid.
Use water spray to reduce vapors; do not put water directly on leak, spill area or inside container.
Do not direct water at spill or source of leak.
Isolate area until gas has dispersed.

6.4 Reference to other sections

- Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

Section 7 - Handling and Storage

7.1 Precautions for safe handling

Handling

- Keep away from heat and ignition sources – No Smoking. Take precautionary measures against static charges. All equipment used when handling the product must be grounded. Use only non-sparking tools. Use only with adequate ventilation. Ventilate closed spaces before entering. Be aware of any signs of dizziness or fatigue, especially if work is done in a poorly ventilated area; exposures to fatal concentrations of this gas mixture could occur without any significant warning symptoms, due to olfactory fatigue or oxygen deficiency. Cylinders should be firmly secured to prevent falling or being knocked-over. Use explosion-proof - electrical, ventilating and/or lighting equipment. Do not attempt to repair, adjust, or in any other way modify cylinders. If there is a malfunction or another type of operational problem, contact nearest distributor immediately. Empty containers retain product residue and can be hazardous. Do not cut, weld, puncture or incinerate container.

7.2 Conditions for safe storage, including any incompatibilities

Storage

- Cylinders should be stored in dry, well-ventilated areas away from sources of heat, ignition and direct sunlight. Do not allow area where cylinders are stored to exceed 52C (125F). Cylinders must be protected from the environment, and preferably kept at room temperature approximately 21C (70F). Protect cylinders against physical damage. Cylinders should be firmly secured to prevent falling or being knocked-over. Store locked up.

7.3 Specific end use(s)

- Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection

8.1 Control parameters

Exposure Limits/Guidelines

- Currently there are no applicable exposure limits established for this material.

Exposure Control Notations

Portugal

•Hydrogen (1333-74-0): **Simple Asphyxiants:** (Simple Asphyxiant)

Ireland

•Hydrogen (1333-74-0): **Simple Asphyxiants:** (Asphyxiant)

Spain

•Hydrogen (1333-74-0): **Simple Asphyxiants:** (simple asphyxiant)

8.2 Exposure controls

Engineering Measures/Controls

- Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Use explosion-proof - electrical, ventilating and/or lighting equipment.

Personal Protective Equipment

Respiratory

- In case of insufficient ventilation, wear suitable respiratory equipment. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/Face

- Wear safety glasses.

Skin/Body

- Wear leather gloves when handling cylinders.

Environmental Exposure Controls

- Follow best practice for site management and disposal of waste. Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

Section 9 - Physical and Chemical Properties

9.1 Information on Physical and Chemical Properties

Material Description			
Physical Form	Gas	Appearance/Description	Colorless gas with pungent odor.
Color	Colorless	Odor	Pungent
Particulate Size	Data lacking	Odor Threshold	Data lacking
General Properties			
Boiling Point	-259.2 C(-434.56 F) Hydrogen	Melting Point	Data lacking

Decomposition Temperature	Data lacking	pH	Data lacking
Specific Gravity/Relative Density	Data lacking	Water Solubility	1.96 mg/L @ 0 C(32 F) Hydrogen
Viscosity	Data lacking	Explosive Properties	Data lacking
Oxidizing Properties:	Data lacking		
Volatility			
Vapor Pressure	79 hPa @ -259 C(-434.2 F) Hydrogen	Vapor Density	0.07 Air=1 Hydrogen
Evaporation Rate	Data lacking		
Flammability			
Flash Point	Data lacking	UEL	Data lacking
LEL	Data lacking	Autoignition	570 to 585 C(1058 to 1085 F) Hydrogen
Flammability (solid, gas)	Data lacking		
Environmental			
Octanol/Water Partition coefficient	Data lacking		

9.2 Other Information

- No additional physical and chemical parameters noted.

Section 10: Stability and Reactivity

10.1 Reactivity

- No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

- Stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions

- Hazardous polymerization not indicated.

10.4 Conditions to avoid

- Contact with incompatible materials and exposure to water, heat, sparks and other sources of ignition.

10.5 Incompatible materials

- Oxidizing agents: hydrogen can react with some metals (i.e. hardened steel) to cause embritlement, alkaline materials, halogens. This material contains Boron Trichloride which reacts violently with water. Avoid contact with moist air.

10.6 Hazardous decomposition products

- No data available

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Component Name	CAS	Data
Boron trichloride (0.5% TO 5%)	10294-34-5	**Acute Toxicity:** ihl-rat LC50:2541 ppm/1H

GHS Properties	Classification

Acute toxicity	**EU/CLP** • Acute Toxicity 3 (Inhalation) - ATEmix (inhl)=2000ppm **OSHA HCS 2012** • Acute Toxicity 3 (Inhalation) - ATEmix (inhl)=2000ppm
Aspiration Hazard	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Carcinogenicity	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Germ Cell Mutagenicity	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Skin corrosion/Irritation	**EU/CLP** • Skin Corrosion 1B **OSHA HCS 2012** • Skin Corrosion 1B
Skin sensitization	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
STOT-RE	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
STOT-SE	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Toxicity for Reproduction	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Respiratory sensitization	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Serious eye damage/Irritation	**EU/CLP** • Serious Eye Damage 1 **OSHA HCS 2012** • Serious Eye Damage 1

Route(s) of entry/exposure
- Inhalation, Skin, Eye

Potential Health Effects

Inhalation

Acute (Immediate)
- Toxic by inhalation. Boron trichloride, a component in this material, is corrosive to mucous surfaces due to its rapid hydrolysis to hydrochloric acid (and boric acid) by moisture.

Chronic (Delayed)
- No data available

Skin

Acute (Immediate)
- Causes severe skin burns and eye damage. Boron trichloride, a component in this material, is corrosive to the skin due to its rapid hydrolysis to hydrochloric acid (and boric acid) by moisture.

Chronic (Delayed)
- No data available

Eye

Acute (Immediate)
- Causes serious eye damage. Boron trichloride, a component in this material, is corrosive to mucous surfaces due to its rapid hydrolysis to hydrochloric acid (and boric acid) by moisture.

Chronic (Delayed)
- No data available

Ingestion

Acute (Immediate)
- Ingestion is not anticipated to be a likely route of exposure to this product.

Chronic (Delayed)
- No data available

Carcinogenic Effects
- The components of this gas mixture are not found on the following lists: FEDERAL OSHA Z LIST, NTP and IARC; therefore, they are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

Section 12 - Ecological Information

12.1 Toxicity

- Material data lacking.

12.2 Persistence and degradability

- Material data lacking.

12.3 Bioaccumulative potential

- Material data lacking.

12.4 Mobility in Soil

- Material data lacking.

12.5 Results of PBT and vPvB assessment

- PBT and vPvB assessment has not been conducted for this material.

12.6 Other adverse effects

- No studies have been found.

Section 13 - Disposal Considerations

13.1 Waste treatment methods

Product waste

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	14.1 UN number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards
DOT	UN1954	Compressed gas, flammable, n.o.s. (Hydrogen, Boron Trichloride)	2.1,8	NDA	NDA
TDG	UN3305	COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. (Hydrogen, Boron trichloride)	2.3,2.1,8	NDA	Potential Marine Pollutant
IMO/IMDG	UN3305	Compressed gas, toxic, flammable, corrosive, n.o.s. (Hydrogen, Boron trichloride)	2.3,2.1,8	NDA	NDA
IATA/ICAO	UN3305	Compressed gas, toxic, flammable, corrosive, n.o.s. (Hydrogen, Boron trichloride)	2.3,2.1,8	NDA	NDA

14.6 Special precautions for user

- Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

14.7 Transport in bulk according to Annex II of

- Not relevant.

MARPOL 73/78 and the IBC Code

14.8 Other information

DOT • For US domestic transportation, this mixture is known to be highly corrosive and must be described and labeled in accordance with 49 CFR 172.202(a)(3) and 172.402(a)(2)

Section 15 - Regulatory Information

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

SARA Hazard Classifications • Acute, Fire, Pressure(Sudden Release of)

State Right To Know				
Component	**CAS**	**MA**	**NJ**	**PA**
Hydrogen	1333-74-0	Yes	Yes	Yes
Boron trichloride	10294-34-5	Yes	Yes	Yes

Inventory						
Component	**CAS**	**Canada DSL**	**Canada NDSL**	**China**	**EU EINECS**	**EU ELNICS**
Hydrogen	1333-74-0	Yes	No	Yes	Yes	No
Boron trichloride	10294-34-5	Yes	No	Yes	Yes	No

Inventory (Con't.)		
Component	**CAS**	**TSCA**
Hydrogen	1333-74-0	Yes
Boron trichloride	10294-34-5	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% A, B1

Canada - WHMIS - Ingredient Disclosure List

- Boron trichloride 10294-34-5 0.5% TO 5% 1 %
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

Environment

Canada - CEPA - Priority Substances List

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

China

Environment

China - Ozone Depleting Substances - First Schedule

• Boron trichloride	10294-34-5	0.5% TO 5%	Not Listed
• Hydrogen	1333-74-0	95% TO 99.5%	Not Listed

China - Ozone Depleting Substances - Second Schedule

• Boron trichloride	10294-34-5	0.5% TO 5%	Not Listed
• Hydrogen	1333-74-0	95% TO 99.5%	Not Listed

China - Ozone Depleting Substances - Third Schedule

• Boron trichloride	10294-34-5	0.5% TO 5%	Not Listed
• Hydrogen	1333-74-0	95% TO 99.5%	Not Listed

Other

China - Annex I & II - Controlled Chemicals Lists

• Boron trichloride	10294-34-5	0.5% TO 5%	Not Listed
• Hydrogen	1333-74-0	95% TO 99.5%	Not Listed

China - Dangerous Goods List

• Boron trichloride	10294-34-5	0.5% TO 5%	UN1741
• Hydrogen	1333-74-0	95% TO 99.5%	UN1049; UN1966

China - Export Control List - Part I Chemicals

• Boron trichloride	10294-34-5	0.5% TO 5%	Not Listed
• Hydrogen	1333-74-0	95% TO 99.5%	Not Listed

—

Europe

Other

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Classification

• Boron trichloride	10294-34-5	0.5% TO 5%	R14 T+; R26/28 C; R34
• Hydrogen	1333-74-0	95% TO 99.5%	F+; R12

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Concentration Limits

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Labelling

- Boron trichloride 10294-34-5 0.5% TO 5% T+ R:14-26/28-34 S:(1/2)-9-26-28-36/37/39-45
- Hydrogen 1333-74-0 95% TO 99.5% F+ R:12 S:(2)-9-16-33

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Notes - Substances and Preparations

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Safety Phrases

- Boron trichloride 10294-34-5 0.5% TO 5% S:(1/2)-9-26-28-36/37/39-45
- Hydrogen 1333-74-0 95% TO 99.5% S:(2)-9-16-33

Germany

Environment

Germany - TA Luft - Types and Classes

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

Germany - Water Classification (VwVwS) - Annex 1

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% ID Number 741, not considered hazardous to water

Germany - Water Classification (VwVwS) - Annex 2 - Water Hazard Classes

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

Germany - Water Classification (VwVwS) - Annex 3

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

Other

Germany - Specifically Regulated Chemicals in TRGS

• Boron trichloride	10294-34-5	0.5% TO 5%	Not Listed
• Hydrogen	1333-74-0	95% TO 99.5%	Not Listed

Portugal

Other

Portugal - Prohibited Substances

• Boron trichloride	10294-34-5	0.5% TO 5%	Not Listed
• Hydrogen	1333-74-0	95% TO 99.5%	Not Listed

United Kingdom

Environment

United Kingdom - Pollution Inventory - Schedule 1 - Thresholds for Releases to Air

• Boron trichloride	10294-34-5	0.5% TO 5%	Not Listed
• Hydrogen	1333-74-0	95% TO 99.5%	Not Listed

United Kingdom - Substances Contained in Dangerous Substances or Preparations

• Boron trichloride	10294-34-5	0.5% TO 5%	Not Listed
• Hydrogen	1333-74-0	95% TO 99.5%	Not Listed

Other

United Kingdom - Workplace Exposure Limits (WELs) - Substances in Review

• Boron trichloride	10294-34-5	0.5% TO 5%	Not Listed
• Hydrogen	1333-74-0	95% TO 99.5%	Not Listed

United Kingdom - The Red List - Dangerous Substances in Water

• Boron trichloride	10294-34-5	0.5% TO 5%	Not Listed
• Hydrogen	1333-74-0	95% TO 99.5%	Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

• Boron trichloride	10294-34-5	0.5% TO 5%	2500 lb TQ
• Hydrogen	1333-74-0	95% TO 99.5%	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

Environment

U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

- Boron trichloride 10294-34-5 0.5% TO 5% 500 lb EPCRA RQ
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

- Boron trichloride 10294-34-5 0.5% TO 5% 500 lb TPQ
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

- Boron trichloride 10294-34-5 0.5% TO 5% 1.0 % de minimis concentration
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

U.S. - California - Proposition 65 - Developmental Toxicity

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

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United States - Pennsylvania

Labor

U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

- Boron trichloride 10294-34-5 0.5% TO 5%
- Hydrogen 1333-74-0 95% TO 99.5% Not Listed

U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances

- Boron trichloride 10294-34-5 0.5% TO 5% Not Listed

• Hydrogen	1333-74-0	95% TO 99.5%	Not Listed

15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

Section 16 - Other Information

Relevant Phrases (code & full text)

- H330 - Fatal if inhaled
  H300 - Fatal if swallowed
  EUH014 - Reacts violently with water.
  R14 - Reacts violently with water.
  R26/28 - Very toxic by inhalation and if swallowed.

Last Revision Date

- 22/March/2013

Preparation Date

- 22/March/2013

Disclaimer/Statement of Liability

- To the best of Air Liquide's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this gas mixture is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

Key to abbreviations

NDA = No Data Available