	SAFETY DATASHEET	Page : 1/11
		Revised edition n° : 10.0
		Revision date : 07/2018
Boron trifluoride		MTG007

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

1.1. Product identifier

Trade name	Boron trifluoride
Chemical description	Boron trifluoride
CAS N°	7637-07-2
CE N°	231-569-5
Index N°	005-001-00-X
Registration n°	01-2119534579-27
Chemical formula	BF ₃

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

Relevant identified uses	Industrial and professional Test gas/Calibration gas Chemical reaction / Synthesis Use for manufacture of electronic/photovoltaic components Laboratory use Contact supplier for more information on uses
Uses advised against	Consumer use not recommended

1.3. Details of the supplier of the safety data sheet

Company identification	MULTIGAS Route de l'Industrie 102 CH-1564 Domdidier
Phone number	+41 (0) 26 676 94 94
E-mail address	info@multigas.ch

1.4. Emergency telephone numbers


145 (Toxicology Centre Zurich) or +41 (0) 44 251 51 51
 +41 (0) 26 676 94 94 (Multigas)

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
	Skin corrosion/irritation, Category 1B	H314

	SAFETY DATASHEET	Page : 2/11
		Revised edition n° : 10.0
		Revision date : 07/2018
Boron trifluoride		MTG007

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
May cause damage to organs through prolonged or repeated exposure cause the hazard	H373

For the complete H-sentences texts mentioned in that chapter, refer to Section 16

2.2. Label elements

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

Hazard pictograms



GHS04

GHS05

GHS06

GHS08

Signal word


Danger

Hazard statements

H280	Contains gas under pressure; may explode if heated
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H330	Fatal if inhaled
H335	May cause respiratory irritation
H373	May cause damage to organs through prolonged or repeated exposure
EUH014	Reacts violently with water
EUH071	Corrosive to the respiratory tract

Precautionary statements

P260	Do not breathe gas, vapours
P280	Wear protective gloves, protective clothing, eye protection, face protection
P303+P361+P353+P315	IF ON SKIN: (or hair) Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Get immediate medical advice / attention
P304+P340+P310	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician
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 / attention
P410+403	Protect from sunlight. Store in a well-ventilated place
P405	Store locked up

	SAFETY DATASHEET	Page : 3/11
		Revised edition n° : 10.0
		Revision date : 07/2018
Boron trifluoride		MTG007

2.3. Other hazards

None

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	Product identifier	Concentration	Classification
Boron trifluoride	(CAS-No.) 7637-07-2 (EC-No.) 231-569-5 (EC Index-No.) 005-001-00-X (Registration-No.) 01-2119534579-27	<= 100%	Press. Gas (Liq.), H280 Acute Tox. 2 (Inhalation: gas), H330 Skin Corr. 1A, H314 Eye Dam. 1, H318 STOT SE 3, H335 STOT RE 2, H373

For the complete H-sentences texts mentioned in that chapter, refer to Section 16

Contains no other components or impurities which will influence the classification of the product

3.2. Mixtures

Not established

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice	See a doctor. Show this safety data sheet to the attending physician
In case of inhalation	In case of inhalation, remove the person from the contaminated area. In case of respiratory arrest, give artificial respiration. See a doctor
In case of skin contact	Remove contaminated clothing and shoes immediately. Wash with soap and plenty of water. Take victim immediately to hospital. See a doctor
In case of eyes contact	Rinse thoroughly with plenty of water for at least 15 minutes and consult a doctor
In case of ingestion	Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. See a doctor

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


May cause severe chemical burns to skin and cornea. Suitable first-aid treatment should be immediately available. Seek medical advice before using product

Material is destructive to tissue of the mucous membranes and upper respiratory tract. Cough, shortness of breath, headache, nausea

Refer to section 11

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

Treat with corticosteroid spray as soon as possible after inhalation

	SAFETY DATASHEET	Page : 4/11
		Revised edition n° : 10.0
		Revision date : 07/2018
Boron trifluoride		MTG007

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Water spray or water mist. Dry powder. Foam
Unsuitable extinguishing media Do not use water jet to extinguish

5.2. Special hazards arising from the substance or mixture

Specific hazards In case of fire or excessive heat, hazardous combustion products may be produced
Exposure to fire may cause containers to rupture/explode

Hazardous combustion products In case of fire or excessive heat, hazardous combustion products may be produced such as : gaseous hydrogen fluoride, borane / boron oxide

5.3. Additional information

Cool endangered receptacles with water spray jet from a protected position

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid breathing vapours, spray mists or gases
Provide adequate ventilation
Remove all sources of ignition
Evacuate personnel to a safe place
Beware of vapours that accumulate forming explosive concentrations.
Vapours may accumulate in low areas
Personal protective equipment, see section 8

6.2. Environmental precautions

Try to stop the leak

6.3. Methods and material for containment and cleaning up

Ventilate the area
Keep area evacuated and free from ignition sources until any spilled liquid has evaporated (ground free from frost)

6.4. Reference to other sections

See also sections 8 and 13

Boron trifluoride

MTG007

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Avoid contact with skin and eyes
 Avoid breathing vapour or mist
 Avoid contact with aluminium
 For precautions, see section 2.2

7.2. Conditions for safe storage, including any incompatibilities

Store in a cool place. Keep container tightly closed in a dry and well-ventilated place
 Content under pressure

7.3. Specific end use(s)

None

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with occupational exposure limits

Component	CAS N°	Exposure value type	Control parameter	Source
Boron trifluoride	7637-07-02	TWA	1 ppm	SUVA: Limit values of exposure to workstations
			3 mg/m ³	
		OEL	1 ppm	SUVA: Limit values of exposure to workstations
			3 mg/m ³	

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Provide adequate general and local exhaust ventilation
 Gas detectors should be used when toxic gases may be released


8.2.2. Individual protection measures, e.g. personal protective equipment

Eye/face protection

Wear goggles and a face shield when transfilling or breaking transfer connections. Standard EN 166

Skin / hand protection

Wear protective gloves when handling gas cylinders. Standard EN 388
 The selected protective gloves have to satisfy the specifications of EU Directive 89/686 / EEC and the standard EN 374 derived from it

	SAFETY DATASHEET	Page : 6/11
		Revised edition n° : 10.0
		Revision date : 07/2018
Boron trifluoride		MTG007

For short-term use

Material: Fluorinated rubber

Penetration time:> 30 min

Glove thickness: 0.6 mm

For long-term use

Material: Fluorinated rubber

Penetration time:> 480 min

Glove thickness: 0.7 mm

Have appropriate, chemical-resistant protective clothing ready for use in emergencies. Standard EN943-1

Respiratory protection

Self-contained breathing apparatus (SCBA) or positive pressure air mask must be used in oxygenated atmospheres. Standard EN 137 - Self-contained compressed air device with a full face mask

8.2.3. Environmental exposure controls

No data available

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

- **Physical state at 20°C / 101.3kPa** Gas
- **Colour** Colourless

Odour No data available

Odour threshold No data available

pH No data available

Melting point / Freezing point -126.8

Boiling point -100°C

Flash point No data available

Evaporation rate No data available

Flammability (solid, gas) No data available

Explosive limits No data available

Vapour pressure [20°C] 0.04 bar

Vapour pressure [50°C] No data available

Vapour density No data available

Relative density, liquid (water=1) 1.6

Relative density, gas (air=1) 2.4

Water solubility No data available

Partition coefficient n-octanol/water (Log Kow) No data available

Boron trifluoride
MTG007

Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	No data available
Oxidising properties	No data available

9.2. Other information

Molar mass	68 g/mole
Critical temperature [°C]	-12.3°C
Relative density, gas	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 recommended storage conditions

10.3. Possibility of hazardous reactions

Reacts violently with water

10.4. Conditions to avoid


 Avoid moisture in installation systems
 Reacts with glass

10.5. Incompatible materials

 Alkaline metals
 Boron trifluoride reacts violently with alkyl nitrates after an induction period of several hours
 Reacts with alkalis or alkaline earth metals
 Do not use mercury manometers because boron trifluoride is soluble in mercury
 Reacts with most metals in the presence of moisture, releasing hydrogen, extremely flammable gas
 For more information on compatibility, refer to ISO 11114

10.6. Hazardous decomposition products

Hazardous products are formed in case of fire: Hydrogen gas flower, borane / boron oxides

	SAFETY DATASHEET	Page : 8/11
		Revised edition n° : 10.0
		Revision date : 07/2018
Boron trifluoride		MTG007

SECTION 11: Toxicological information

11.1. Chemical safety assessment

Acute toxicity	Fatal if inhaled
Skin corrosion/irritation	Causes severe skin burns and eye damage
Serious eye damage/irritation	Causes serious eye damage
Respiratory or skin sensitisation	No data available
Germ cell mutagenicity	No data available
Carcinogenicity	No data available
Reproductive toxicity	No data available
STOT-single exposure – Target organ(s)	Severe corrosion to the respiratory tract at high concentrations
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure
Ingestion hazard	No data available

SECTION 12: Ecological information

12.1. Toxicity

Assessment	Classification criteria are not met
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12.2. Persistence and degradability

No data available

12.3. Bioaccumulative potential

No data available

12.4. Mobility in soil


No data available

12.5. Results of PBT and vPvB assessment

PBT / vPvB assessment is not available because the chemical safety assessment is not required / is not conducted

12.6. Other adverse effects

No data available

	SAFETY DATASHEET	Page : 9/11
		Revised edition n° : 10.0
		Revision date : 07/2018
Boron trifluoride		MTG007

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product	<p>Must not be released into the atmosphere</p> <p>The gas can be washed with an alkaline solution under controlled conditions to avoid a violent reaction</p> <p>The waste gas must be burned in an incinerator equipped with an afterburner and a purification system</p> <p>Return to the supplier the product not consumed in its original container</p>
Contaminated container	<p>Return to the supplier the product not consumed in its original container</p> <p>Contact the supplier if instructions are needed</p>
OMoD Code	<p>16 05 04</p> <p>Gases in pressure containers containing dangerous substances</p>

SECTION 14: Transport information



14.1. UN number

Transport par road/rail ADR / RID	Transport by sea IMDG	Transport by air IATA
1008	1008	1008

14.2. UN proper shipping name

Transport par road/rail ADR / RID	Transport by sea IMDG	Transport by air IATA
Boron trifluoride	Boron trifluoride	Boron trifluoride

14.3. Transport hazard class(es)


Labelling	 
ADR/RID IMDG IATA	<p>2.3 : Toxic gases</p> <p>8 : Corrosive substances</p>

14.4. Packing group

ADR/RID IMDG IATA	<p>Not established</p>
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14.5. Environmental hazards

ADR/RID	None
IMDG	None

	SAFETY DATASHEET	Page : 10/11
		Revised edition n° : 10.0
		Revision date : 07/2018
Boron trifluoride		MTG007

ICAO-TI / IATA-DGR

None

14.6. Special precautions for user

No data available

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

SECTION 15: Regulatory information

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

This safety data sheet complies with the requirements of Regulation (CE) No. 1907/2006

15.2. Chemical safety assessment

A CSA does not need to be carried out for this product

SECTION 16: Other information

Indication of changes

Revised safety data sheet in accordance with commission regulation (EU) No 2015/830

Abbreviations and acronyms

ADR : European Agreement concerning the International Carriage of Dangerous Goods by Road

CAS : Chemical Abstract Service number (USA)

CLP : Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008

CSA : Chemical Safety Assessment

EIGA : European Industrial Gases Association

EINECS : European Inventory of Existing Commercial Chemical Substances

EN : European Standard

ATE : Acute Toxicity Estimate

IATA : International Air Transport Association

IMDG Code : International Maritime Dangerous Goods Code

LC50 : Lethal Concentration to 50 % of a test population

OMoD : Swiss Ordinance on the movement of waste

PBT : Persistent, Bioaccumulative and Toxic

PPE: Personal Protection Equipment


REACH : Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006

RID : Regulations concerning the international carriage of dangerous goods by rail

RMM : Risk Management Measures

STOT-SE : Specific Target Organ Toxicity - Single Exposure

UN : United Nations

	SAFETY DATASHEET	Page : 11/11
		Revised edition n° : 10.0
		Revision date : 07/2018
Boron trifluoride		MTG007

vPvB : Very Persistent and Very Bioaccumulative
WGK: Water Hazards Class

Full text of H, EUH and P statements used in sections 2 and 3

Hazard statements

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H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H330	Fatal if inhaled
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P303+P361+P353+P315	IF ON SKIN: (or hair) Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Get immediate medical advice / attention
P304+P340+P310	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician
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 / attention
P410+403	Protect from sunlight. Store in a well-ventilated place
P405	Store locked up

Disclaimer of liability

Details given in this document have been prepared based on the most available reliable documents and are believed to be correct at the time of going to press
They do not claim to be exhaustive and should be considered as a guide