



## MATERIAL SAFETY DATA SHEET

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### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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**TAIYU INDUSTRIAL GASES Limited**  
16/F, Kowloon building,  
555 Nathan Road, Mongkok  
Kowloon,  
Hong Kong  
TELEPHONE NUMBER: (852)22979277

**Chengdu Taiyu Industrial Gases Co.,Ltd**  
Chengluo Avenue, Longquan District,  
Chengdu City, China (Mainland)  
TELEPHONE NUMBER: (86) 28-88455212(commonly)

**SUBSTANCE: BORON TRIFLUORIDE**

**TRADE NAMES/SYNONYMS:**

MTG MSDS 9; BORON FLUORIDE; BORANE, TRIFLUORIDE; TRIFLUOROBORANE;  
TRIFLUOROBORON; BORON FLUORIDE (BF<sub>3</sub>); UN 1008; BF<sub>3</sub>; MAT03320; RTECS ED2275000

**CHEMICAL FAMILY:** inorganic, gas, non-metallic, halides

**CREATION DATE:** Jan 24 1989

**REVISION DATE:** Dec 15 2003

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### 2. COMPOSITION, INFORMATION ON INGREDIENTS

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**COMPONENT:** BORON TRIFLUORIDE

**CAS NUMBER:** 7637-07-2

**PERCENTAGE:** 100

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### 3. HAZARDS IDENTIFICATION

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**NFPA RATINGS (SCALE 0-4):** HEALTH=3 FIRE=0 REACTIVITY=1

**EMERGENCY OVERVIEW:**

**COLOR:** colorless

**PHYSICAL FORM:** gas

**ODOR:** pungent odor

**MAJOR HEALTH HAZARDS:** potentially fatal if inhaled, respiratory tract burns, skin burns, eye burns, kidney damage

**PHYSICAL HAZARDS:** May react on contact with water. Releases corrosive gases. Releases toxic gases. Pressurized containers may rupture or explode if exposed to sufficient heat.

**POTENTIAL HEALTH EFFECTS:**

**INHALATION:**



**SHORT TERM EXPOSURE:** potentially fatal if inhaled, burns

**LONG TERM EXPOSURE:** burns, kidney damage

**SKIN CONTACT:**

**SHORT TERM EXPOSURE:** burns

**LONG TERM EXPOSURE:** burns

**EYE CONTACT:**

**SHORT TERM EXPOSURE:** burns

**LONG TERM EXPOSURE:** burns

**INGESTION:**

**SHORT TERM EXPOSURE:** ingestion of harmful amounts is unlikely

**LONG TERM EXPOSURE:** ingestion of harmful amounts is unlikely

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## 4. FIRST AID MEASURES

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**INHALATION:** If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

**SKIN CONTACT:** Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing and shoes before reuse. Destroy contaminated shoes.

**EYE CONTACT:** Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

**INGESTION:** If a large amount is swallowed, get medical attention.

**NOTE TO PHYSICIAN:** For inhalation, consider oxygen.

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## 5. FIRE FIGHTING MEASURES

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**FIRE AND EXPLOSION HAZARDS:** Negligible fire hazard. Pressurized containers may rupture or explode if exposed to sufficient heat.

**EXTINGUISHING MEDIA:** carbon dioxide, regular dry chemical

Large fires: Use regular foam or flood with fine water spray.

**FIRE FIGHTING:** Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. Keep unnecessary people away, isolate hazard area and deny entry. Use extinguishing agents appropriate for surrounding fire. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Reduce vapors with water spray. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

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## 6. ACCIDENTAL RELEASE MEASURES

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**OCCUPATIONAL RELEASE:**

Stop leak if possible without personal risk. Reduce vapors with water spray. Do not get water directly on material. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Ventilate closed spaces before entering. Evacuation radius: 150 feet. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675

(USA).

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## 7. HANDLING AND STORAGE

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**STORAGE:** Store and handle in accordance with all current regulations and standards. Protect from physical damage. Store outside or in a detached building. Store in a well-ventilated area. Store below 54 C. Store in a cool, dry place. Store in a tightly closed container. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355.30). Keep separated from incompatible substances.

**HANDLING:** Subject to handling regulations: U.S. OSHA 29 CFR 1910.119.

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## 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

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### EXPOSURE LIMITS:

#### BORON TRIFLUORIDE:

1 ppm (3 mg/m<sup>3</sup>) OSHA ceiling

1 ppm ACGIH ceiling

1 ppm (3 mg/m<sup>3</sup>) NIOSH recommended ceiling

**VENTILATION:** Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

**EYE PROTECTION:** Wear splash resistant safety goggles with a face shield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

**CLOTHING:** Wear appropriate chemical resistant clothing.

**GLOVES:** Wear appropriate chemical resistant gloves.

**RESPIRATOR:** The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

#### 10 ppm

Any supplied-air respirator.

#### 25 ppm

Any supplied-air respirator operated in a continuous-flow mode.

Any self-contained breathing apparatus with a full face piece.

Any supplied-air respirator with a full face piece.

#### Escape -

Any air-purifying respirator with a full face piece and a canister providing protection against this substance.

Any appropriate escape-type, self-contained breathing apparatus.

#### For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with full face piece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full face piece

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**PHYSICAL STATE:** gas

**COLOR:** colorless

**ODOR:** pungent odor

**MOLECULAR WEIGHT:** 67.81

**MOLECULAR FORMULA:** B-F<sub>3</sub>

**BOILING POINT:** -148 F (-100 C)

**FREEZING POINT:** -197 F (-127 C)

**VAPOR PRESSURE:** 653.9 mmHg @ -120 C

**VAPOR DENSITY (air=1):** 2.3

**SPECIFIC GRAVITY:** Not applicable

**DENSITY:** 2.867 g/L

**WATER SOLUBILITY:** reacts

**PH:** Not applicable

**VOLATILITY:** Not applicable

**ODOR THRESHOLD:** 1.5 ppm

**EVAPORATION RATE:** Not applicable

**VISCOSITY:** 0.0171 cP @ 25 C

**COEFFICIENT OF WATER/OIL DISTRIBUTION:** Not applicable

**SOLVENT SOLUBILITY:**

**Soluble:** concentrated sulfuric acid, concentrated nitric acid, benzene, dichlorobenzene, chloroform, carbon tetrachloride, carbon disulfide, aromatic solvents, halogenated solvents

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## 10. STABILITY AND REACTIVITY

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**REACTIVITY:** May react on contact with water. Releases corrosive gases. Releases toxic gases.

**CONDITIONS TO AVOID:** Minimize contact with material. Containers may rupture or explode if exposed to heat.

**INCOMPATIBILITIES:** metals, oxidizing materials, combustible materials

**HAZARDOUS DECOMPOSITION:**

Thermal decomposition products or contact with water or moisture: acid halides, halogenated compounds, hydrogen fluoride, organic acids

**POLYMERIZATION:** Will not polymerize.

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## 11. TOXICOLOGICAL INFORMATION

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**BORON TRIFLUORIDE:**

**TOXICITY DATA:**

1180 mg/m<sup>3</sup> inhalation-rat LC<sub>50</sub>

**LOCAL EFFECTS:**

Corrosive: inhalation, skin, eye

**ACUTE TOXICITY LEVEL:**

Highly Toxic: inhalation

**TARGET ORGANS:** kidneys

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** eye disorders, skin disorders, kidney disorders, respiratory disorders



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## 12. ECOLOGICAL INFORMATION

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### ECOTOXICITY DATA:

**FISH TOXICITY:** 15000000 ug/L 24 hour(s) LC50 (Mortality) Bluegill (*Lepomis macrochirus*)

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## 13. DISPOSAL CONSIDERATIONS

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Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR

262. Hazardous Waste Number(s): D003.

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## 14. TRANSPORT INFORMATION

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### U.S. DOT 49 CFR 172.101:

**PROPER SHIPPING NAME:** Boron trifluoride

**ID NUMBER:** UN1008

**HAZARD CLASS OR DIVISION:** 2.3

**LABELING REQUIREMENTS:** 2.3

### QUANTITY LIMITATIONS:

**PASSENGER AIRCRAFT OR RAILCAR:** Forbidden

**CARGO AIRCRAFT ONLY:** Forbidden

**ADDITIONAL SHIPPING DESCRIPTION:** Toxic-Inhalation Hazard Zone B

### CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

**SHIPPING NAME:** Boron trifluoride, compressed

**UN NUMBER:** UN1008

**CLASS:** 2.3; 8

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## 15. REGULATORY INFORMATION

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### U.S. REGULATIONS:

**CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):** Not regulated.

**SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):**

**BORON TRIFLUORIDE:** 500 LBS TPQ

**SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):**

**BORON TRIFLUORIDE:** 500 LBS RQ

**SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):**

ACUTE: Yes

CHRONIC: Yes

FIRE: No

REACTIVE: Yes

SUDDEN RELEASE: Yes

**SARA TITLE III SECTION 313 (40 CFR 372.65):**

**BORON TRIFLUORIDE**

**OSHA PROCESS SAFETY (29CFR1910.119):**

**BORON TRIFLUORIDE:** 250 LBS TQ

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**STATE REGULATIONS:**

**California Proposition 65:** Not regulated.

**CANADIAN REGULATIONS:**

**WHMIS CLASSIFICATION:** AD1E

**NATIONAL INVENTORY STATUS:**

**U.S. INVENTORY (TSCA):** Listed on inventory.

**TSCA 12(b) EXPORT NOTIFICATION:** Not listed.

**CANADA INVENTORY (DSL/NDSL):** Not determined.

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**16. OTHER INFORMATION**

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