

# MATERIAL SAFETY DATA SHEET

---

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

---

**MATHESON TRI-GAS, INC.**  
**150 Allen Road Suite 302**  
**Basking Ridge, New Jersey 07920**  
**Information: 1-800-416-2505**

**Emergency Contact:**  
**CHEMTREC 1-800-424-9300**  
**Calls Originating Outside the US:**  
**703-527-3887 (Collect Calls Accepted)**

### **SUBSTANCE: DIBORANE**

#### **TRADE NAMES/SYNONYMS:**

MTG MSDS 111; BOROETHANE; BOROHYDRIDE; BIBORON HEXAHYDRIDE; DIBORANE(6); UN 1911; B2H6; MAT06650; RTECS HQ9275000

**CHEMICAL FAMILY:** metal, hydrides

**PRODUCT USE:** industrial

**CREATION DATE:** Jan 24 1989

**REVISION DATE:** Dec 11 2008

---

## 2. COMPOSITION, INFORMATION ON INGREDIENTS

---

**COMPONENT:** DIBORANE

**CAS NUMBER:** 19287-45-7

**PERCENTAGE:** 100.0

---

## 3. HAZARDS IDENTIFICATION

---

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



#### **EMERGENCY OVERVIEW:**

**COLOR:** colorless

**PHYSICAL FORM:** gas

**ODOR:** irritating odor

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

**PHYSICAL HAZARDS:** May explode when heated. Flammable gas. May cause flash fire.

**POTENTIAL HEALTH EFFECTS:**

**INHALATION:**

**SHORT TERM EXPOSURE:** burns, difficulty breathing, headache, dizziness, blurred vision, lung congestion, kidney damage, liver damage, death

**LONG TERM EXPOSURE:** same as effects reported in short term exposure

**SKIN CONTACT:**

**SHORT TERM EXPOSURE:** irritation (possibly severe)

**LONG TERM EXPOSURE:** no information is available

**EYE CONTACT:**

**SHORT TERM EXPOSURE:** irritation (possibly severe)

**LONG TERM EXPOSURE:** no information is available

**INGESTION:**

**SHORT TERM EXPOSURE:** no information on significant adverse effects

**LONG TERM EXPOSURE:** no information is available

---

## 4. FIRST AID MEASURES

---

**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 medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

**EYE CONTACT:** 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.

---

## 5. FIRE FIGHTING MEASURES

---

**FIRE AND EXPLOSION HAZARDS:** Severe fire hazard. Gas/air mixtures are explosive.

**EXTINGUISHING MEDIA:** Let burn unless leak can be stopped immediately.

**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. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile). Stop flow of gas.

**FIRE FIGHTING PROTECTIVE EQUIPMENT:** Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

**FLASH POINT:** -130 F (-90 C) (CC)

**LOWER FLAMMABLE LIMIT:** 0.8%

**UPPER FLAMMABLE LIMIT:** 88%

**AUTOIGNITION:** 100-126 F (38-52 C)

**HAZARDOUS COMBUSTION PRODUCTS:**

Thermal decomposition or combustion products: oxides of boron, hydrogen, boric acid

---

## 6. ACCIDENTAL RELEASE MEASURES

---

**OCCUPATIONAL RELEASE:**

Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry. Remove sources of ignition. Ventilate closed spaces before entering. 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).

---

## 7. HANDLING AND STORAGE

---

**STORAGE:** Store and handle in accordance with all current regulations and standards. Protect from physical damage. Store and handle in a detached building. Refrigerate. Store in a well-ventilated area. Avoid contact with air. Keep separated from incompatible substances. 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 Part B).

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

---

## 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

---

**EXPOSURE LIMITS:**

**DIBORANE:**

0.1 ppm (0.1 mg/m<sup>3</sup>) OSHA TWA

0.1 ppm ACGIH TWA

0.1 ppm (0.1 mg/m<sup>3</sup>) NIOSH recommended TWA 10 hour(s)

**VENTILATION:** Provide local exhaust or process enclosure ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with

applicable exposure limits.

**EYE PROTECTION:** Wear splash resistant safety goggles. 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.

**1 ppm**

Any supplied-air respirator.

**2.5 ppm**

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

**5 ppm**

Any supplied-air respirator with a tight-fitting facepiece that is operated in a continuous-flow mode.

Any self-contained breathing apparatus with a full facepiece.

Any supplied-air respirator with a full facepiece.

**15 ppm**

Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode.

Emergency or planned entry into unknown concentrations or IDLH conditions -

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

**Escape -**

Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern.

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

---

## 9. PHYSICAL AND CHEMICAL PROPERTIES

---

**PHYSICAL STATE:** gas

**COLOR:** colorless

**ODOR:** irritating odor

**MOLECULAR WEIGHT:** 27.68

**MOLECULAR FORMULA:** B<sub>2</sub>-H<sub>6</sub>

**BOILING POINT:** -134 F (-92 C)

**FREEZING POINT:** -265 F (-165 C)

**DECOMPOSITION POINT:** Not available

**VAPOR PRESSURE:** 27460 mmHg @ 15 C

**VAPOR DENSITY (air=1):** 0.96

**SPECIFIC GRAVITY (water=1):** 0.210 @ 15 C

**WATER SOLUBILITY:** reacts

**PH:** Not applicable

**VOLATILITY:** Not applicable

**ODOR THRESHOLD:** 2 mg/m<sup>3</sup>

**EVAPORATION RATE:** Not applicable

**VISCOSITY:** Not available

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

**SOLVENT SOLUBILITY:**

**Soluble:** carbon disulfide, ammonium hydroxide, concentrated sulfuric acid

---

## 10. STABILITY AND REACTIVITY

---

**REACTIVITY:** May decompose explosively when heated above 40 C. May ignite on contact with water or moist air.

**CONDITIONS TO AVOID:** Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers.

**INCOMPATIBILITIES:** metals, bases, oxidizing materials, combustible materials, halo carbons

**HAZARDOUS DECOMPOSITION:**

Decomposition products on contact with water or moisture: hydrogen, boric acid

Thermal decomposition or combustion products: oxides of boron, hydrogen, boric acid

**POLYMERIZATION:** Will not polymerize.

---

## 11. TOXICOLOGICAL INFORMATION

---

**DIBORANE:**

**TOXICITY DATA:** 40 ppm/4 hour(s) inhalation-rat LC50

**LOCAL EFFECTS:**

Irritant: skin, eye

Corrosive: inhalation

**ACUTE TOXICITY LEVEL:**

Highly Toxic: inhalation

**TARGET ORGANS:** respiratory system

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** respiratory disorders, skin disorders and allergies

---

## 12. ECOLOGICAL INFORMATION

---

**ECOTOXICITY DATA:**

**FISH TOXICITY:** No data available.

**INVERTEBRATE TOXICITY:** No data available.

**ALGAL TOXICITY:** No data available.

**FATE AND TRANSPORT:**

**BIODEGRADATION:** No data available.

**ABIOTIC DEGRADATION:** Will decompose on contact with water to form boric acid.

---

### 13. DISPOSAL CONSIDERATIONS

---

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. D003.

---

### 14. TRANSPORT INFORMATION

---

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

**PROPER SHIPPING NAME:** Diborane

**ID NUMBER:** UN1911

**HAZARD CLASS OR DIVISION:** 2.3

**LABELING REQUIREMENTS:** 2.3; 2.1

**QUANTITY LIMITATIONS:**

**PASSENGER AIRCRAFT OR RAILCAR:** Forbidden

**CARGO AIRCRAFT ONLY:** Forbidden

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



**CANADIAN TRANSPORTATION OF DANGEROUS GOODS:**

**SHIPPING NAME:** Diborane, compressed

**UN NUMBER:** UN1911

**CLASS:** 2.3; 2.1

---

### 15. REGULATORY INFORMATION

---

**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 Subpart B):**

**DIBORANE:** 100 LBS TPQ

**SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C):**

**DIBORANE: 100 LBS RQ**

**SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):**

ACUTE: Yes

CHRONIC: No

FIRE: Yes

REACTIVE: Yes

SUDDEN RELEASE: Yes

**SARA TITLE III SECTION 313 (40 CFR 372.65):** Not regulated.

**OSHA PROCESS SAFETY (29 CFR 1910.119):**

**DIBORANE: 100 LBS TQ**

**STATE REGULATIONS:**

**California Proposition 65:** Not regulated.

**CANADIAN REGULATIONS:**

**WHMIS CLASSIFICATION:** ABD1

**NATIONAL INVENTORY STATUS:**

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

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

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

---

**16. OTHER INFORMATION**

---

**MSDS SUMMARY OF CHANGES**

7. HANDLING AND STORAGE

15. REGULATORY INFORMATION

“RTECS®” is a United States trademark owned and licensed under authority of the U.S. Government, by and through Symyx Software, Inc. Portions ©Copyright 2001, U.S. Government. All rights reserved.

©Copyright 1984-2008 ChemADVISOR, Inc. All rights reserved.

**MATHESON TRI-GAS, INC. MAKES NO EXPRESS OR IMPLIED WARRANTIES, GUARANTEES OR REPRESENTATIONS REGARDING THE PRODUCT OR THE INFORMATION HEREIN, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR USE. MATHESON TRI-GAS, INC. SHALL NOT BE LIABLE FOR ANY PERSONAL INJURY, PROPERTY OR OTHER DAMAGES OF ANY NATURE, WHETHER COMPENSATORY, CONSEQUENTIAL, EXEMPLARY, OR OTHERWISE,**



**MATHESON  
TRI•GAS**

ask. . .The Gas Professionals™

Page 8 of 8

**RESULTING FROM ANY PUBLICATION, USE OR RELIANCE UPON THE INFORMATION  
HEREIN.**