



# Scott Specialty Gases

## Material Safety Data Sheets

MSDS No: **19287-45-7**

Date: 03/09/2001

**SUPPLIER ADDRESS:** 6141 Easton Road, Bldg. 1  
PO Box 310  
Plumsteadville, PA 18949-0310

**EMERGENCY PHONE NUMBER:** (215) 766-8861

### 1. CHEMICAL PRODUCT

PRODUCT NAME: **DIBORANE**

SYNONYMS: **Diboron Hexahydride**

### 2. COMPOSITION, INFORMATION ON INGREDIENTS

#### Exposure Limits (PPM)

Ingredient Name	Formula	CAS #	Concentration	ACGIH TLV	OSHA PEL	MAC	Other STEL
DIBORANE	B <sub>2</sub> H <sub>6</sub>	19287-45-7	99+%	.1	.1	.1	NE

Note: NE = NONE ESTABLISHED

S/A = SIMPLE ASPHYXIANT

### 3. HAZARD IDENTIFICATION

#### \*\*\* EMERGENCY OVERVIEW \*\*\*

Poisonous, pyrophoric flammable liquid and gas under pressure.

May be fatal if inhaled.

May cause lung, kidney and central nervous system damage.

Can ignite on contact with air.

May form explosive mixtures with air.

#### POTENTIAL HEALTH EFFECTS

ROUTES OF ENTRY: **Inhalation , Skin**

ACUTE EFFECTS: **Diborane is highly toxic. Symptoms include tightness in chest, coughing, wheezing, lightheadedness, headache, fatigue and drowsiness. Overexposure to large doses may result in irritation of the lungs, pulmonary edema, and damage to the liver and kidney.**

CHRONIC EFFECTS: **Kidney and liver damage.**

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: **None known**

OTHER EFFECTS OF OVEREXPOSURE: **None**

CARCINOGENICITY (US ONLY):

NTP - **No**

IARC MONOGRAPHS - **No**

OSHA REGULATED - No

#### 4. FIRST AID MEASURES

**INHALATION:** Immediately remove victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.

**EYE CONTACT:** Immediately flush with copious amounts of water for at least 15 minutes.

**SKIN CONTACT:** Immediately flush with copious amounts of water for at least 15 minutes while removing contaminated clothing.

**INGESTION:** None

**IN EVENT OF EXPOSURE, CONSULT A PHYSICIAN**

**NOTE TO PHYSICIAN:** It is advisable for trained personnel to administer pure oxygen to anyone suspected of having inhaled diborane. Areas which have come into contact with diborane should be flushed with a 3% aqueous ammonium hydroxide solution, and thereafter cleansed with soap and water.

#### 5. FIRE FIGHTING MEASURES

**FLASH POINT:** Gas

**AUTOIGNITION TEMPERATURE:** 38-52 deg.C

**FLAMMABLE LIMITS:** Vol.%

LOWER: .8

UPPER: 98

**EXTINGUISHING MEDIA:** Try to stop flow of gas if this can be done safely. Allow to burn. Do not use a direct water stream on fire. Do not use halogenated extinguishing agents.

**SPECIAL FIRE FIGHTING INSTRUCTION AND EQUIPMENT:** Wear self-contained breathing apparatus and full protective clothing. If possible, stop the product flow or let it burn itself out. Keep fire exposed cylinders cool with water spray.

**HAZARDOUS COMBUSTION PRODUCTS:** Borane compounds.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** Cylinder rupture may occur under fire conditions. Forms impact sensitive mixtures with halogenated hydrocarbons. Diborane will ignite spontaneously in air or at slightly above room temperature. Vapors may travel a considerable distance to the source of ignition and flash back.

#### 6. ACCIDENTAL RELEASE MEASURES

**CLEAN UP PROCEDURES:** Evacuate and ventilate area. Remove all sources of heat and ignition. Remove leaking cylinder to exhaust hood or safe outdoor area if this can be done safely.

**SPECIALIZED EQUIPMENT:** None

## 7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING: Secure cylinder when using to protect from falling. Use suitable hand truck to move cylinders. Use explosion proof ventilation, piping, and equipment. Use only in a well-ventilated area.

PRECAUTIONS TO BE TAKEN IN STORAGE: Store in well ventilated areas. Keep valve protection cap on cylinders when not in use. Be sure storage area is cool and dry.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide adequate general and local exhaust ventilation to maintain concentrations below exposure and flammable limits.

EYE / FACE PROTECTION: Safety glasses or Goggles. Face shield

SKIN PROTECTION: Protective gloves.

RESPIRATORY PROTECTION: Use a self-contained breathing apparatus in case of emergency or non-routine use.

OTHER PROTECTIVE EQUIPMENT: Safety shoes when handling cylinders.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless

ODOR: Sweet odor.

PHYSICAL PRESSURE: Gas

VAPOR PRESSURE: N/Av

VAPOR DENSITY (AIR=1): 0.96

BOILING POINT (C): -92.8

SOLUBILITY IN WATER: Hydrolyzes

SPECIFIC GRAVITY (H<sub>2</sub>O=1): @-33 deg.C: .341

EVAPORATION RATE: N/Av

ODOR THRESHOLD: N/Av

## 10. STABILITY AND REACTIVITY

STABILITY: Unstable at elevated temperatures.

CONDITIONS TO AVOID: Avoid material storage at ambient temperatures.

MATERIALS TO AVOID: Reacts with moist air, oxidizing agents, ammonia, halogenated hydrocarbons, rubber and elastomers.

HAZARDOUS POLYMERIZATION: May occur. Higher molecular weight hydrides. Higher borane products (typically tetra-borane) may be more shock sensitive than diborane.

HAZARDOUS DECOMPOSITION: None

## 11. TOXICOLOGICAL INFORMATION

LETHAL CONCENTRATION (LC50): 80 ppm, rat 1 hour

LETHAL DOSE 50 (LD50): N/Ap

TERATOGENICITY: N/Ap

REPRODUCTIVE EFFECTS: N/Ap

MUTAGENICITY: N/Ap

## 12. ECOLOGICAL INFORMATION

No adverse ecological effects are expected.

## 13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Dispose of non-refillable cylinders in accordance with federal, state and local regulations. Allow gas to vent slowly to atmosphere in an unconfined area or exhaust hood. If the cylinders are the refillable type, return cylinders to supplier with any valve outlet plugs or caps secured and valve protection caps in place.

## 14. TRANSPORT INFORMATION

CONCENTRATION: 99+%

DOT DESCRIPTION (US ONLY):

PROPER SHIPPING NAME: Diborane, compressed  
HAZARD CLASS: 2.3 (poison gas), Hazard Zone A  
IDENTIFICATION NUMBER: UN1911  
REPORTABLE QUANTITIES: None  
LABELING: POISON GAS, FLAMMABLE GAS

ADR / RID (EU Only): Class 2, 1TF

SPECIAL PRECAUTIONS: Cylinders should be transported in a secure upright position in a well ventilated truck.

## 15. REGULATORY INFORMATION

OSHA: Process Safety Management: Material is listed in appendix A of 29 CFR 1910.119 as highly hazardous chemical.

TSCA: Material is listed in TSCA inventory.

SARA: The threshold planning quantity for this material is 100 lbs.

EU NUMBER: 242-940-6

NUMBER IN ANNEX 1 OF DIR 67/548: Not listed in annex 1.

EU CLASSIFICATION: N/Av

R: N/Av

S: N/Av

## 16. OTHER INFORMATION

OTHER PRECAUTIONS: Protect containers from physical damage. Do not deface cylinders or labels. Cylinders should be refilled by qualified producers of compressed gas. Shipment of a compressed gas cylinder which has not been filled by the owner or with his written consent is a violation of federal law (49 CFR).

ABBREVIATIONS: N/Ap - Not Applicable N/Av - Not Available SA - Simple Asphyxiant NE - None Established

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