



**MATERIAL SAFETY DATA SHEET**

**PRODUCT NAME: ISOBUTANE**

**1. Product and Company Identification**

**BOC Gases,  
Division of,  
The BOC Group, Inc.  
575 Mountain Avenue  
Murray Hill, NJ 07974**

**BOC Gases  
Division of  
BOC Canada Limited  
5975 Falbourne Street, Unit 2  
Mississauga, Ontario L5R 3W6**

**TELEPHONE NUMBER: (908) 464-8100  
24-HOUR EMERGENCY TELEPHONE NUMBER:  
CHEMTREC (800) 424-9300**

**TELEPHONE NUMBER: (905) 501-1700  
24-HOUR EMERGENCY TELEPHONE NUMBER:  
(905) 501-0802  
EMERGENCY RESPONSE PLAN NO: 2-0101**

**PRODUCT NAME: ISOBUTANE  
CHEMICAL NAME: Isobutane  
COMMON NAMES/SYNONYMS: 2-Methylpropane, Trimethylmethane  
TDG (Canada) CLASSIFICATION: 2.1  
WHMIS CLASSIFICATION: A, B1**

**PREPARED BY: Loss Control (908)464-8100/(905)501-1700  
PREPARATION DATE: 6/1/95  
REVIEW DATES: 06/18/04**

**2. Composition, Information on Ingredients**

**EXPOSURE LIMITS<sup>1</sup>:**

<b>INGREDIENT</b>	<b>% VOLUME</b>	<b>PEL-OSHA<sup>2</sup></b>	<b>TLV-ACGIH<sup>3</sup></b>	<b>LD<sub>50</sub> or IC<sub>50</sub> Route/Species</b>
Isobutane FORMULA: C <sub>4</sub> H <sub>10</sub> CAS: 75-28-5 RTECS #: No Data	99.0 to 99.9	None Established	1000 ppm	LC <sub>50</sub> : 581,500 ppm Inhalation/rat (15 minutes)

<sup>1</sup> Refer to individual state or provincial regulations, as applicable, for limits which may be more stringent than those listed here.

<sup>2</sup> As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)

<sup>3</sup> As stated in the ACGIH 2004 Threshold Limit Values for Chemical Substances and Physical Agents.

OSHA Regulatory Status: This material is classified as hazardous under OSHA regulations.

**3. Hazards Identification**

**EMERGENCY OVERVIEW**

Odorless, colorless flammable gas. Dangerous fire and explosion hazard. Avoid heat, sparks and flames. Inhalation of high concentrations may cause central nervous system (CNS) depression and cardiac sensitization. Rapidly expanding gas may cause frostbite. Contents under pressure. Use and store below 125 °F.

PRODUCT NAME: ISOBUTANE

**ROUTE OF ENTRY:**

Skin Contact No	Skin Absorption No	Eye Contact No	Inhalation Yes	Ingestion No
--------------------	-----------------------	-------------------	-------------------	-----------------

**HEALTH EFFECTS:**

Exposure Limits Yes	Irritant No	Sensitization No
Teratogen No	Reproductive Hazard No	Mutagen No
Synergistic Effects None Reported		

Carcinogenicity: -- NTP: No IARC: No OSHA: No

**EYE EFFECTS:** Contact with rapidly expanding gas near the point of release may cause frostbite.

**SKIN EFFECTS:** Contact with rapidly expanding gas near the point of release may cause frostbite with redness, skin color change to gray or white, and blistering.

**INGESTION EFFECTS:** Ingestion is unlikely.

**INHALATION EFFECTS:** Inhalation of high concentrations may cause central nervous system depression with dizziness, disorientation, incoordination, nausea, and narcosis. High concentrations may also cause cardiac sensitization resulting in irregular heartbeat and may make the individual more susceptible to cardiac effects of substances such as epinephrine and adrenaline.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** None known.

**POTENTIAL ENVIRONMENTAL EFFECTS:** Not expected to be toxic to fish and wildlife.

#### 4. First Aid Measures

**EYES:** None required for gas. If frostbite is suspected, flush eyes with cool water for 15 minutes and obtain immediate medical attention.

**SKIN:** None required for gas. For frostbite, immerse skin in lukewarm water. DO NOT USE HOT WATER. Obtain medical attention.

**INGESTION:** Not normally required. Seek immediate medical attention.

**INHALATION:** PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO PRODUCT. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given assisted (artificial) respiration and supplemental oxygen. Further treatment should be symptomatic and supportive.

**Note to Physician:** Monitor cardiac rhythm and treat arrhythmias as necessary. DO NOT administer stimulants such as epinephrine or adrenaline.

PRODUCT NAME: ISOBUTANE

## 5. Fire Fighting Measures

Conditions of Flammability: Flammable liquid and vapor		
Flash point: -117°F (-83°C)	Method: Closed Cup	Autoignition Temperature: 778°F (420°C)
LEL(%): 1.8	UEL(%): 8.4	
Hazardous combustion products: Carbon monoxide, Carbon dioxide		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: Not Available		

**FIRE AND EXPLOSION HAZARDS:** Flammable gas. Isobutane is heavier than air and may travel a considerable distance to an ignition source. Rapid flame propagation and flashback possible. Keep away from open flame and other sources of ignition. Do not allow smoking in storage areas or when handling. Cylinder may vent rapidly or rupture violently from pressure when involved in a fire situation.

**EXTINGUISHING MEDIA:** Water, carbon dioxide, dry chemical.

**FIRE FIGHTING INSTRUCTIONS:** If possible, stop the flow of gas. Inerting the atmosphere to reduce oxygen levels may extinguish flame, allowing capping of leaking container. Do not attempt this unless specifically trained. Reduce the rate of flow and inject an inert gas, if possible, before completely stopping the flow to prevent flashback. Do not extinguish the fire until the supply is shut off as otherwise an explosive re-ignition may occur. If the fire is extinguished and the flow of gas continues, use increased ventilation to prevent build-up of explosive atmosphere. Use non-sparking tools to close container valves.

Use water spray to cool surrounding containers. Be cautious of a Boiling Liquid Evaporating Vapor Explosion, BLEVE, if flame is impinging on surrounding containers. Direct 500 GPM water stream onto containers above liquid level with remote monitors. Limit the number of personnel in proximity of fire and evacuate surrounding areas in all directions.

Firefighters should wear respiratory protection (SCBA) and full turnout or Bunker gear. Continue to cool fire-exposed cylinders until well after flames are extinguished.

## 6. Accidental Release Measures

Immediately extinguish all ignition sources. No smoking, flares, flames or sparks in hazard area. Evacuate all personnel from affected area. Use appropriate protective equipment (See Section 8). Increase ventilation to prevent build up of a flammable/explosive atmosphere. Ventilation should be suitable for use in a potentially flammable atmosphere. Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. Ventilate enclosed areas. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest BOC location.

## 7. Handling and Storage

**Electrical Classification:** Not Available.

Earth bond and ground all lines and equipment associated with the system. All equipment should be non-sparking and explosion proof.

Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure regulator when connecting cylinder to lower pressure piping or systems.

<b>PRODUCT NAME: ISOBUTANE</b>
--------------------------------

Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Do not insert any object (i.e.: screwdriver) into valve cap openings as this can damage the valve causing leakage. Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125°F (52°C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders from being stored for excessive periods of time. Post "NO SMOKING" signs in use and storage areas. There should be no sources of ignition in areas where this product is being used or stored. Outside or detached storage is preferred.

For additional recommendations, consult Compressed Gas Association Pamphlet P-1.

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

## 8. Exposure Controls, Personal Protection

**ENGINEERING CONTROLS:** Use local exhaust and general ventilation systems to control air contaminants at or below acceptable exposure guidelines and prevent build up of flammable concentrations. Small quantities can be handled in forced ventilation hoods. If product is handled routinely where the potential for leaks exists, all electrical equipment must be rated for use in potentially flammable atmospheres. Consult the National Electrical Code for details.

**EYE/FACE PROTECTION:** Safety goggles or glasses.

**SKIN PROTECTION:** Protective gloves of suitable material.

**RESPIRATORY PROTECTION:** For emergency release use a positive pressure NIOSH approved air-supplying respirator systems (SCBA or airline/escape bottle) using at a minimum Grade D air.

**OTHER/GENERAL PROTECTION:** Safety shoes, emergency eyewash station

## 9. Physical and Chemical Properties

<b>PARAMETER</b>	<b>VALUE</b>	<b>UNITS</b>
Physical state (gas, liquid, solid)	: Gas	
Vapor pressure at 70°F	: 45	psia
Vapor density at STP (Air = 1)	: 2.06	
Evaporation point	: Not Available	
Boiling point	: 10.9	°F
	: -11.7	°C
Freezing point	: Not Available	
pH	: Not Available	
Specific gravity	: Not Available	
Oil/water partition coefficient	: Not Available	
Solubility (H <sub>2</sub> O)	: Very Slight	
Odor threshold	: Not Applicable	
Odor and appearance	: A colorless, odorless gas..	

PRODUCT NAME: ISOBUTANE

## 10. Stability and Reactivity

**STABILITY:** Stable

**INCOMPATIBLE MATERIALS/CONDITIONS:** Incompatible with oxidizers. Avoid heat, sparks, and flame. Product will start to decompose at 815 °F (435 °C).

**HAZARDOUS DECOMPOSITION PRODUCTS:** Carbon monoxide

**HAZARDOUS POLYMERIZATION:** Will not occur.

## 11. Toxicological Information

**INHALATION:** High concentrations of aliphatic hydrocarbon gases may cause CNS depression. Recent information suggests that C1-C4 aliphatic (alkane) hydrocarbon gases can cause potentially fatal cardiac arrhythmias. Cardiac sensitization to adrenalin in dogs has been noted following inhalation. In dogs, the heart was more sensitive to epinephrine induced ventricular fibrillations following exposure to 15-90% propane for 10 minutes. Ventricular fibrillations have been reported in a 15-year old girl and a 14-year old boy following inhalation of n-butane (concentration not reported).

**SKIN AND EYE:** Contact with gas is not expected to cause irritation.

**OTHER:** Not given.

## 12. Ecological Information

Product does not contain Class I or Class II ozone depleting substances. Not toxic. Will not bioconcentrate.

## 13. Disposal Considerations

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to BOC Gases or authorized distributor for proper disposal.

## 14. Transport Information

PARAMETER	United States DOT	Canada TDG
PROPER SHIPPING NAME:	Isobutane	Isobutane
HAZARD CLASS:	2.1	2.1
IDENTIFICATION NUMBER:	UN 1969	UN 1969
SHIPPING LABEL:	FLAMMABLE GAS	FLAMMABLE GAS

## 15. Regulatory Information

### SARA TITLE III NOTIFICATIONS AND INFORMATION

#### SARA TITLE III - HAZARD CLASSES:

Fire Hazard  
Sudden Release of Pressure Hazard  
Acute Health Hazard

#### SARA TITLE III - SECTION 313 SUPPLIER NOTIFICATION:

This product does not contain toxic chemicals subject to reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372.

**U.S. TSCA/Canadian DSL:** All ingredients are listed on the U.S. Toxic Substances Control Act (TSCA) inventory or exempt from listing and on the Canadian Domestic Substance List (DSL).

**California Proposition 65:** This product does not contain ingredient(s) known to the State of California to cause cancer or reproductive toxicity.

**Canadian Controlled Products Regulations (CPR):** This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

## 16. Other Information

### NFPA HAZARD CODES

Health: 0  
Flammability: 4  
Instability: 0

### HMIS HAZARD CODES

Health: 1  
Flammability: 4  
Physical Hazard: 2

### RATINGS SYSTEM

0 = No Hazard  
1 = Slight Hazard  
2 = Moderate Hazard  
3 = Serious Hazard  
4 = Severe Hazard

Note: Ratings were assigned in accordance with Compressed Gas Association (CGA) guidelines as published in CGA Pamphlet P-19-2004, *CGA Recommended Hazard Ratings for Compressed Gases, 2<sup>nd</sup> Edition*.

ACGIH	American Conference of Governmental Industrial Hygienists
DOT	Department of Transportation
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
SARA	Superfund Amendments and Reauthorization Act
STEL	Short Term Exposure Limit
TDG	Transportation of Dangerous Goods
TLV	Threshold Limit Value
WHMIS	Workplace Hazardous Materials Information System

Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of transportation regulations.

### DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).