

**MATERIAL SAFETY DATA SHEET**

PRODUCT NAME: LASER GAS  
(CARBON DIOXIDE/NITROGEN/HELIUM MIXTURE)

**1. Chemical 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:** CARBON DIOXIDE/NITROGEN/HELIUM MIXTURE  
**CHEMICAL NAME:** Carbon Dioxide and Nitrogen in Helium  
**COMMON NAMES/SYNONYMS:** Laser Gas  
**TDG (Canada) CLASSIFICATION:** 2.2  
**WHMIS CLASSIFICATION:** A

**PREPARED BY:** Loss Control (908)464-8100/(905)501-1700  
**PREPARATION DATE:** 6/1/95  
**REVIEW DATES:** 6/1/99

**2. Composition, Information on Ingredients****EXPOSURE LIMITS<sup>1</sup>:**

INGREDIENT	% VOLUME	PEL-OSHA <sup>2</sup>	TLV-ACGIH <sup>3</sup>	LD <sub>50</sub> or LC <sub>50</sub> Route/Species
Helium FORMULA: He CAS: 7440-59-7 RTECS #: MH6520000	73-98.5	None Established	Simple Asphyxiant	Not Available
Carbon Dioxide FORMULA: CO <sub>2</sub> CAS: 124-38-9 RTECS #: FF6400000	0.5-13.5	5000 ppm TWA	5,000 ppm TWA 30,000 ppm STEL	Not Available
Nitrogen FORMULA: N <sub>2</sub> CAS: 7727-37-9 RTECS #: QW9700000	1-13.5	None Established	Simple Asphyxiant	Not Available

<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 1998-1999 Threshold Limit Values for Chemical Substances and Physical Agents.

IDLH (Carbon Dioxide): 40,000 ppm

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

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### 3. Hazards Identification

**EMERGENCY OVERVIEW**

Odorless, colorless, nonflammable gas. Simple Asphyxiant – This product does not contain oxygen and may cause asphyxia if released in a confined area. Maintain oxygen levels above 19.5%. Carbon dioxide exposure can cause nausea and respiratory problems. High concentrations may cause vasodilation leading to circulatory collapse. Contents under pressure. Use and store below 125 °F.

**ROUTE OF ENTRY:**

Skin Contact No	Skin Absorption No	Eye Contact No	Inhalation Yes	Ingestion No
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**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:**

None reported.

**SKIN EFFECTS:**

None reported.

**INGESTION EFFECTS:**

None reported.

**INHALATION EFFECTS:**

Carbon dioxide is a cerebral vasodilator. Inhaling large concentrations can cause rapid circulatory insufficiency leading to coma and death. Chronic, harmful effects are not known from repeated inhalation of low concentrations. Lower concentrations of carbon dioxide may cause increased respiration and headache.

Depending on concentration of carbon dioxide present, product may act as an asphyxiant. Effects of oxygen deficiency resulting from simple asphyxiants may include: rapid breathing, diminished mental alertness, impaired muscular coordination, faulty judgment, depression of all sensations, emotional instability, and fatigue. As asphyxiation progresses, nausea, vomiting, prostration, and loss of consciousness may result, eventually leading to convulsions, coma, and death.

Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

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

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**NFPA HAZARD CODES**

Health: 0  
 Flammability: 0  
 Instability: 0

**HMIS HAZARD CODES**

Health: 0  
 Flammability: 0  
 Reactivity: 0

**RATINGS SYSTEM**

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

**4. First Aid Measures**

**EYES:**

None required.

**SKIN:**

None required.

**INGESTION:**

None required.

**INHALATION:**

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. 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 mouth-to-mouth resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

**5. Fire Fighting Measures**

Conditions of Flammability: Nonflammable		
Flash point: None	Method: Not Applicable	Autoignition Temperature: None
LEL(%): None	UEL(%): None	
Hazardous combustion products: None		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: None		

**FIRE AND EXPLOSION HAZARDS:**

Nonflammable. Containers may rupture violently from pressure when involved in a fire situation.

**EXTINGUISHING MEDIA:**

None required. Use media appropriate for surrounding materials.

**FIRE FIGHTING INSTRUCTIONS:**

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**

Evacuate all personnel from affected area. Use appropriate protective equipment. Ventilate closed spaces. Personnel should not re-enter area until product has dispersed. If lead 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:**

Non-Hazardous

Gas mixture is non-corrosive and may be used with any common structural material.

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 reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping or systems. 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 system.

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 being stored for excessive periods of time.

For additional storage recommendations, consult Compressed Gas Association's Pamphlet P-1 and Safety Bulletin SB-2.

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 to prevent accumulation of high concentrations and control air contaminants to at or below acceptable exposure guidelines. Maintain atmospheric oxygen at or above 19.5%.

### **EYE/FACE PROTECTION:**

Safety goggles or glasses.

### **SKIN PROTECTION:**

Protective industrial work gloves made of any suitable material.

### **RESPIRATORY PROTECTION:**

An airline respirator with full facepiece equipped with an escape bottle or a self-contained breathing apparatus should be available for emergency use. Operate this equipment in the positive pressure demand mode.

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**OTHER/GENERAL PROTECTION:**

Safety shoes.

**9. Physical and Chemical Properties**

<b>PARAMETER</b>	<b>VALUE</b>	<b>UNITS</b>
Physical state (gas, liquid, solid)	: Gas	
Vapor pressure	: Not Available	
Vapor density (Air = 1)	: 0.1785 g/L (helium)	@ 0 °C
Evaporation point	: -268.9 (helium)	°C
Boiling point	: Not Available	
	: Not Available	
Freezing point	: Not Available	
	: Not Available	
PH	: Not Applicable	
Specific gravity	: Not Available	
Oil/water partition coefficient	: Not Available	
Solubility (H <sub>2</sub> O)	: Slight	
Odor threshold	: Not Applicable	
Odor and appearance	: Odorless; colorless gas	

**10. Stability and Reactivity**

**STABILITY:**

Stable

**INCOMPATIBLE MATERIALS:**

None

**HAZARDOUS DECOMPOSITION PRODUCTS:**

None

**HAZARDOUS POLYMERIZATION:**

Will not occur.

**11. Toxicological Information**

Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

Exposure of female rats to 60,000 ppm carbon dioxide for 24 hours has produced toxic effects to the embryo and fetus in pregnant rats. Toxic effects to the reproductive system have been observed in other mammalian species at similar concentrations.

**OTHER:**

Inhaling high concentrations of carbon dioxide may cause circulatory insufficiency leading to coma and death. Chronic, harmful effects are not known from repeated inhalation of low (3 to 5 molar %) concentrations.

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## 12. Ecological Information

No data given.

## 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:	Compressed gases, n.o.s. (Carbon Dioxide, Helium, Nitrogen)	Compressed gases, n.o.s.
HAZARD CLASS:	2.2	2.2
IDENTIFICATION NUMBER:	UN 1956	UN 1956
SHIPPING LABEL:	NONFLAMMABLE GAS	NONFLAMMABLE GAS

## 15. Regulatory Information

### SARA TITLE III NOTIFICATIONS AND INFORMATION

#### SARA TITLE III - HAZARD CLASSES:

Sudden Release of Pressure Hazard

## 16. Other Information

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.

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