



**MATERIAL SAFETY DATA SHEET**

**PRODUCT NAME: NITROUS OXIDE**

**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: (905) 501-1700**

**TELEPHONE NUMBER: (908) 464-8100**

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

**24-HOUR EMERGENCY TELEPHONE NUMBER:  
(905) 501-0802**

**EMERGENCY RESPONSE PLAN NO: 20101**

**PRODUCT NAME: NITROUS OXIDE**

**CHEMICAL NAME: Nitrous Oxide**

**COMMON NAMES/SYNONYMS: Dinitrogen Monoxide, Laughing Gas, Factitious Air, Hyponitrous Acid Anhydride**

**TDG (Canada) CLASSIFICATION: 2.2 (5.1)**

**WHMIS CLASSIFICATION: A, C, D1B, D2A**

**PREPARED BY: Loss Control (908)464-8100/(905)501-1700**

**PREPARATION DATE: 6/1/95**

**REVIEW DATES: 6/7/96**

**2. Composition, Information on Ingredients**

<b>INGREDIENT</b>	<b>% VOLUME</b>	<b>PEL-OSHA<sup>1</sup></b>	<b>TLV-ACGIH<sup>2</sup></b>	<b>LD<sub>50</sub> or LC<sub>50</sub> Route/Species</b>
Nitrous Oxide FORMULA: N <sub>2</sub> O CAS: 10024-97-2 RTECS #: QX1350000	98.0 to 99.995	Not Available	50 ppm TWA	LC <sub>50</sub> 160 mg/m <sup>3</sup> /6H (rat)

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

<sup>2</sup> As stated in the ACGIH 1994-95 Threshold Limit Values for Chemical Substances and Physical Agents

**3. Hazards Identification**

**EMERGENCY OVERVIEW**

Anesthetic effects at high concentrations. Asphyxia by exclusion of oxygen. Reproductive Hazard. Nonflammable. Oxidizer. May accelerate combustion of other materials.

PRODUCT NAME: NITROUS OXIDE

**ROUTE OF ENTRY:**

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

Exposure Limits Yes	Irritant No	Sensitization No
Teratogen Yes	Reproductive Hazard Yes	Mutagen Yes
Synergistic Effects Other agents that depress the central nervous system		

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

**EYE EFFECTS:**

Adverse effects not anticipated.

**SKIN EFFECTS:**

Adverse effects not anticipated.

**INGESTION EFFECTS:**

None known. Ingestion is unlikely.

**INHALATION EFFECTS:**

High concentrations may cause deep breathing, dizziness, nausea and eventual unconsciousness due to inadequate oxygen supply. Anesthetic effects may occur when mixed with oxygen at a ratio of 80% nitrous oxide to 20% oxygen. Laughter effects seem to occur after incipient asphyxia accompanied by the sudden return of oxygen as in air. Nitrous oxide is a slight narcotic, but lacks substantial toxicity. Asphyxia will occur due to oxygen exclusion. Maintain oxygen levels above 19.5% at sea level.

Chronic effects of overexposure may include reproductive effects.

**NFPA HAZARD CODES**

Health: 2  
Flammability: 0  
Reactivity: 0

**HMIS HAZARD CODES**

Health: 2  
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:**

Never introduce ointment or oil into the eyes without medical advice! If pain is present, refer the victim to an ophthalmologist for treatment and follow up.

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**SKIN:**

No adverse effects anticipated.

**INGESTION:**

None required.

**INHALATION:**

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO NITROUS OXIDE. 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 artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

### 5. Fire Fighting Measures

Conditions of Flammability: Not Flammable		
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. May decompose violently at temperatures above 1112°F (600°C).

**EXTINGUISHING MEDIA:**

Use extinguishing media suitable for the combustible materials involved in the fire.

**FIRE FIGHTING INSTRUCTIONS:**

None required. Use media suitable for surrounding fire.

### 6. Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment. 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

Use only in well-ventilated areas. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Do not heat cylinder by any means to increase the discharge rate of product from the container. Use a check valve or trap in the discharge line to prevent hazardous back flow into the container.

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

Protect containers from physical damage. Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperatures where containers are stored to exceed 130°F (54°C). Containers should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use "first in-first out" inventory system to prevent full containers being stored for excessive periods of time.

## 8. Exposure Controls, Personal Protection

### 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
Nitrous Oxide FORMULA: N <sub>2</sub> O CAS: 10024-97-2 RTECS #: QX1350000	98.0 to 99.995	Not Available	50 ppm TWA	LC <sub>50</sub> 160 mg/m <sup>3</sup> /6H (rat)

<sup>1</sup> Refer to individual state of 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 1994-1995 Threshold Limit Values for Chemical Substances and Physical Agents.

### ENGINEERING CONTROLS:

Use local exhaust to prevent accumulation of high concentrations that may reduce the oxygen level in the air to less than 19.5%.

### EYE/FACE PROTECTION:

Chemical safety goggles or safety glasses. Do not wear contact lenses.

### SKIN PROTECTION:

Use protective gloves; any material suitable to the use situation.

### RESPIRATORY PROTECTION:

Self-contained breathing apparatus should be available for emergency use.

### OTHER/GENERAL PROTECTION:

Safety shoes, safety shower.

## 9. Physical and Chemical Properties

PARAMETER	VALUE	UNITS
Physical state (gas, liquid, solid)	: Gas	
Vapor pressure at 20°C	: 736.	psig
Vapor density (Air = 1)	: 1.529	
Evaporation point	: Not Available	
Boiling point	: -127.2	°F
	: -88.47	°C
Freezing point	: -131.5	°F
	: -90.81	°C
pH	: Not Applicable	
Specific gravity at boiling	: 1.227	
Oil/water partition coefficient	: Not Available	
Solubility (H2O)	: Slightly Soluble	
Odor threshold	: Not Available	
Odor and appearance	: Colorless gas, slightly sweet taste and odor. Liquid appears similar to water.	

## 10. Stability and Reactivity

### STABILITY:

Stable

### INCOMPATIBLE MATERIALS

All flammable materials. Nitrous oxide will serve as the oxidant for most flammable materials. Some flammables will have a lower flammable limit in nitrous oxide than in pure oxygen. Powerful reducing agents will react violently.

### HAZARDOUS DECOMPOSITION PRODUCTS:

At elevated temperatures. Nitrous oxide decomposes into nitrogen and oxygen, the rate of decomposition being appreciable at about 1112°F (600°C). Nitrous oxide exposed to fire or other intense heat source may decompose violently.

### HAZARDOUS POLYMERIZATION:

Will not occur.

## 11. Toxicological Information

### REPRODUCTIVE:

Reproductive toxicity has been observed in experimental animals exposed at concentrations in excess of the current TLV. These toxic effects include:

Toxic effects to newborn rats after exposure of pregnant female to 50,000 ppm for 4 hours.

Toxic effects to testes, epididymis, sperm duct in male rat following exposures of 200,000 ppm for 8 hours.

Effects on embryo and fetus in exposed rats. Teratogenic effects observed in other mammalian species.

### MUTAGENIC:

MSDS: G-3

Revised: 6/7/96

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Effects on genetic material have been observed in human, mammalian and insect mutation test systems exposed at concentrations of 50,000 ppm or greater.

**OTHER:**

Blood changes, including changes in erythrocyte and leukocyte count, have been reported in experimental rats and mice exposed at near the current TLV (50 ppm). Changes in body and liver weight have been reported.

**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**

<b>PARAMETER</b>	<b>United States DOT</b>	<b>Canada TDG</b>
<b>PROPER SHIPPING NAME:</b>	Nitrous Oxide, compressed	Nitrous Oxide, compressed
<b>HAZARD CLASS:</b>	2.2	2.2 (5.1)
<b>IDENTIFICATION NUMBER:</b>	UN 1070	UN 1070
<b>SHIPPING LABEL:</b>	NONFLAMMABLE GAS, OXIDIZER	NONFLAMMABLE GAS, OXIDIZER

**15. Regulatory Information**

**SARA TITLE III NOTIFICATIONS AND INFORMATION**

**SARA TITLE III - HAZARD CLASSES:**

Acute Health Hazard  
Fire Hazard  
Reactivity Hazard

**16. Other Information**

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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**DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:**

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