

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

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

BOC Gases
Division of
BOC Canada Limited
5975 Falbourne Street, Unit 2
Mississauga, Ontario L5R 3W6
TELEPHONE NUMBER: (905) 501-1700

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

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, D2A

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 LIMITS¹:

INGREDIENT	% VOLUME	PEL-OSHA ²	TLV-ACGIH ³	LD ₅₀ or LC ₅₀ Route/Species
Nitrous Oxide FORMULA: N ₂ O CAS: 10024-97-2 RTECS #: QX1350000	98.0 to 99.995	Not Available	50 ppm TWA	Not Available

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

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

³ As stated in the ACGIH 1998-1999 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

Colorless nonflammable gas with slightly sweet odor. Oxidizer. Will accelerate combustion and increase the risk of fire and explosion in combustible or flammable material. Anesthetic effects at high concentrations. Intentional misuse of this product can be harmful or fatal. Repeated abuse of nitrous oxide can have long-term health effects. Asphyxia by exclusion of oxygen. Reproductive Hazard. Contents under pressure. Use and store below 125 °F.

PRODUCT NAME: NITROUS OXIDE

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 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.

Intentional misuse or abuse of this product may be harmful or fatal. Repeated abuse can have long-term health effects.

Repeated exposure over time may adversely affect the liver, kidneys, nervous system, blood, reproductive system and fetus.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None known.

NFPA HAZARD CODES

Health: 2
Flammability: 0
Instability: 0
OXIDIZER

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:

None required.

SKIN:

None required.

MSDS: G-3

Revised: 6/1/99

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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. Can readily support or initiate combustion/explosion of organic matter and other oxidizable material. May decompose violently at temperatures above 1112°F (600°C). Cylinder may rupture violently from pressure when involved in a fire situation.

EXTINGUISHING MEDIA:

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

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

Extinguish all ignition sources. Evacuate all personnel from affected area. A leak near combustible or flammable materials may represent a severe fire or explosion hazard. 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

Electrical classification: Nonhazardous

Use only in well-ventilated areas. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Use a pressure reducing regulator when connecting cylinder to lower pressure piping or systems. 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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Revised: 6/1/99

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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 125°F (52°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. "Post NO SMOKING OR OPEN FLAMES" signs in the storage or use area. There should be no sources of ignition in the storage or use area.

Due to increased misuse and abuse of nitrous oxide, handling storage precautions should be implemented to prevent theft and improper use. The following recommendations may not include all precautions which are necessary. Nitrous oxide systems should be installed in accordance with CGA G-8.1, "Standard for Nitrous Oxide Systems at Consumer Sites." Keep full and empty nitrous oxide containers and utilization equipment stored in a secured area. Allow only authorized personnel to remove containers. Inventory and account for both full and empty containers and bulk product. Promptly report any theft of nitrous oxide to the police and the supplier. Establish other procedures as necessary to check for unusual use or loss of nitrous oxide.

Never carry a compressed gas cylinder or a container of gas in a 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.

For additional recommendations, consult Compressed Gas Association's Pamphlet P-1, G-8.1, G-8.2, and SB-6.

8. Exposure Controls, Personal Protection

ENGINEERING CONTROLS:

Local exhaust ventilation as necessary to control air contaminants to at or below acceptable exposure guidelines.

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

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 (H ₂ O)	: 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, inorganic and combustible 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

INHALATION:

Nitrous oxide has a weak narcotic effect. High concentrations may cause loss of consciousness.

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.

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MUTAGENIC:

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

CHRONIC:

Increased incidence of liver and kidney disease has been reported in dentists and dental assistants heavily exposed to nitrous oxide. Neurological symptoms following repeated inhalation may include numbness, tingling, and weakness. Bone marrow toxicity has occurred in rats exposed for 2 or more days to 80% nitrous oxide/20% oxygen mixtures.

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:	Nitrous Oxide	Nitrous Oxide, compressed
HAZARD CLASS:	2.2	2.2 (5.1)
IDENTIFICATION NUMBER:	UN 1070	UN 1070
SHIPPING LABEL:	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
- Sudden Release of Pressure Hazard
- Chronic Health 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.

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:

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