

STOODY INDUSTRIAL AND WELDING SUPPLY, INC.

MATERIAL SAFETY DATA SHEET (MSDS)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Nitrous Oxide

CHEMICAL NAME: Nitrous Oxide

CHEMICAL FAMILY: Oxidizer

FORMULA: N₂O

SYNONYMS: Dinitrogen monoxide, laughing gas, nitrogen monoxide, nitrous oxide USP

NAME AND ADDRESS:

STOODY INDUSTRIAL AND WELDING SUPPLY, INC.
3316 National Avenue
San Diego, CA 92113

TELEPHONE:

Emergency Phone: (800) 633-8253 (24 hr.)
Routine information call: (619) 234-6750
Weekdays 7:30 AM – 5:00 PM

[USE]: Medical, industrial, food industry

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME /CAS NUMBER	PERCENTAGE	OSHA PEL	ACGIH TLV
NITROUS OXIDE/10024-97-2 [LD ₅₀]: None.	>99% [LC ₅₀]: None.	None	50 ppm

Note: NIOSH has recommended a TWA of 25 ppm during anesthetic administration, and 50 ppm in dental offices.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

WARNING! High pressure oxidizing liquid and gas.
Vigorously accelerates combustion.
Can cause rapid suffocation.
Can cause anesthetic effects.
May cause frostbite.

POTENTIAL HEALTH EFFECTS INFORMATION:

ROUTES OF EXPOSURE:

INHALATION: Simple asphyxiant. Nitrous oxide is nontoxic, but may cause suffocation by displacing the oxygen in air. Exposure to oxygen-deficient atmosphere (<19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8-10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.

Exposure to concentrations of 50% or greater will produce euphoria, loss of coordination, slurred speech, dulling of senses, loss of consciousness, and clinical anesthesia. These symptoms may resemble intoxication, hence the name "laughing gas". At higher concentrations, approaching 100%, inhalation may cause deep breathing, dizziness, nausea, and central nervous system depression.

WARNING: The misuse of nitrous oxide can cause death by reducing the amount of oxygen necessary to support life. Nitrous oxide abuse can impair an individual's ability to make and implement life sustaining decisions.

EYE CONTACT: Contact with liquid or cold vapor can cause freezing of tissue.

SKIN CONTACT: Contact with liquid or cold vapor can cause frostbite.

[SKIN ABSORPTION]: Not applicable.

[INGESTION]: Not applicable.

CHRONIC EFFECTS: Nitrous oxide has been associated with several effects from long term exposure. The most strongly substantiated effect is neuropathy (degenerative changes to the nervous system). Complaints include numbness, tingling of hands and legs, loss of feeling in fingers, poor balance, and muscular weakness. Epidemiological studies also suggest fetotoxic effects and higher incidents of spontaneous abortion in exposed personnel. Although no cause and effect relationship has been firmly established, exposure to the gas should be minimized.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: Pregnant women should avoid exposure to nitrous oxide. See Section 11 "Toxicological Information"

OTHER EFFECTS OF OVEREXPOSURE: See Section 11 "Toxicological Information"

CARCINOGENICITY: Nitrous oxide is not listed by NTP, OSHA or IARC.

4. FIRST AID MEASURES

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INHALATION: Persons suffering from lack of oxygen should be removed to fresh air. If victim is not breathing, administer artificial respiration. Vomiting may occur as the person awakes. In order to prevent aspiration, exposed individuals should be placed on their side with their head at the level or slightly lower than their body. If breathing is difficult, or dulling of senses is present, administer oxygen. Obtain prompt medical attention.

Rescue personnel should be aware of the extreme fire hazards associated with oxidizer-enriched atmospheres.

EYE CONTACT: Contact with liquid or cold vapor can cause freezing of tissue. Gently flush eyes with lukewarm water. Obtain medical attention immediately.

SKIN CONTACT: Contact with liquid or cold vapor can cause frostbite. Immediately warm affected area with lukewarm water not to exceed 105°F (40°C).

INGESTION: Not applicable.

NOTES TO PHYSICIAN: Nitrous oxide may suppress immunological function when administered for anesthetic purposes. This may reduce the resistance to infection and other immuno-dependent disease processes. Nitrous oxide may cause vitamin B-12 deficiency. Megaloblastic anemia and nervous system disorders can occur as a result of this chemically induced deficiency. More detailed information can be found in Section 11 "Toxicological Information".

5. FIRE FIGHTING MEASURES

FLASH POINT: Not applicable.

AUTOIGNITION: Not applicable.

FLAMMABLE LIMITS IN AIR BY VOLUME:

LOWER: Not applicable. **UPPER:** Not applicable.

EXTINGUISHING MEDIA: Nitrous oxide is nonflammable and will support combustion. Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING INSTRUCTIONS: Evacuate all personnel from the danger area. If possible, shut off flow of nitrous oxide which is supporting the fire. Immediately cool containers with water spray from maximum distance. When cool, move containers from fire area, if without risk.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Oxidizing agent, vigorously accelerates combustion. Some materials which are noncombustible in air will burn in the presence of an oxidizing agent. Nitrous oxide may form explosive compounds when exposed to combustible materials or oil, grease, and other hydrocarbon materials

Upon exposure to intense heat or flame, cylinder will vent rapidly and or rupture violently. Most cylinders are designed to vent contents when exposed to elevated temperatures.

Pressure in a container can build up due to heat and it may rupture if pressure relief devices should fail to function.

HAZARDOUS COMBUSTION PRODUCTS: None

[SENSITIVITY TO STATIC DISCHARGE]: None

[SENSITIVITY TO MECHANICAL IMPACT]: None

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Evacuate all unnecessary personnel from the affected area. Shut off source of nitrous oxide, if possible. Remove sources of heat, ignition and, if possible, separate combustibles from the leak.

Ventilate enclosed area or move leaking container to a well-ventilated area. If leaking from cylinder or its valve, contact your supplier.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN STORAGE: Store and use with adequate ventilation. Cylinders should be separated from flammables by a minimum distance of 20 ft. or by a barrier of non-combustible material at least 5 ft. high having a fire resistance rating of at least 1/2 hour. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling or being knocked over. Post "No Smoking or Open Flames" signs in the storage area. Protect cylinders from physical damage; do not drag, roll, slide or drop. Do not allow storage area temperature to exceed 125° F (52° C). Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time.

Because of its "laughing gas" anesthetic effect, nitrous oxide is often subject to theft and misuse. Cylinders should be stored and used in a controlled area.

PRECAUTIONS TO BE TAKEN IN HANDLING: Use a suitable hand truck for cylinder movement. Never attempt to lift a cylinder by its valve protection cap. Keep cylinders and their valves free from oil and grease. Open valve slowly. If user experiences difficulty operating cylinder valve, discontinue use and contact supplier. Never insert an object (e.g., wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit. Use an adjustable strap wrench to remove over-tight or rusted caps. For additional precautions in using nitrous oxide see Section 16 - Other Information.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

VENTILATION: Natural or mechanical to prevent accumulation in worker's breathing zone above exposure limits. (See Section 2).

RESPIRATORY PROTECTION (SPECIFY TYPE):

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General Use: Not required.

Emergency Use: Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen deficient atmosphere. Air purifying respirators will not provide protection.

PROTECTIVE GLOVES: Work gloves are recommended when handling cylinders. If used, gloves must be clean and free of oil and grease.

EYE PROTECTION: Safety glasses are recommended when handling cylinders.

OTHER PROTECTIVE EQUIPMENT: Safety shoes are recommended when handling cylinders.

9. PHYSICAL AND CHEMICAL PROPERTIES

MOLECULAR WEIGHT: 44.013

BOILING POINT (1 ATM): -127.4° F (-88.5° C)

SPECIFIC GRAVITY (Air =1): At 70° F (21.1° C) and 1 atm: 1.53

FREEZING POINT/MELTING POINT: At 1 atm: -131.5° F (-90.8° C)

VAPOR PRESSURE (AT 70° F): 745 psig

GAS DENSITY: At 70° F (21.1° C) and 1 atm: 0.1146 lb/cu ft (1.947 kg/cu m³)

EVAPORATION RATE (Butyl Acetate=1): Gas, not applicable.

SOLUBILITY IN WATER: Vol/Vol at 32° F (0° C): 1.3

EXPANSION RATIO: Not applicable.

[pH]: Not applicable

APPEARANCE, ODOR AND STATE: Colorless gas with slightly sweet odor and taste at normal temperature and pressure.

[COEFFICIENT OF WATER/OIL DISTRIBUTION]: Not Applicable

[ODOR THRESHOLD]: Not known

10. STABILITY AND REACTIVITY

STABILITY: Stable

CONDITIONS TO AVOID: Excess heat. Decomposes at elevated temperature (1202° F (650° C)) to nitrogen and oxygen. This reaction will occur at lower temperatures in the presence of catalytic surfaces such as silver, platinum, cobalt, copper oxides, or nickel oxides.

INCOMPATIBILITY (Materials to Avoid): Flammable materials, hydrocarbons such as oils and grease, asphalt, ethers, alcohol's, acids and aldehydes. Alkali metals, boron, tungsten carbide, and aluminum.

REACTIVITY:

- A) **HAZARDOUS DECOMPOSITION PRODUCTS:** Nitrogen and oxygen.
- B) **HAZARDOUS POLYMERIZATION:** Will not occur.

11. TOXICOLOGICAL INFORMATION

Exposure to nitrous oxide has produced embryofetal toxicity in animals as evidenced by reduced fetal weight, delayed ossification, and increased incidence of visceral and skeletal variations. Exposure may be associated with increased incidence of abortion in humans. Single prolonged exposure to high concentrations of nitrous oxide has resulted in bone marrow injury and adverse effects in blood.

[IRRITANCY OF MATERIAL]: None

[SENSITIZATION TO MATERIAL]: None

[REPRODUCTIVE EFFECTS]: None

[TERATOGENICITY]: None

[MUTAGENICITY]: None .

[SYNERGISTIC MATERIALS]: None

12. ECOLOGICAL INFORMATION

No adverse ecological effects are expected. Nitrous Oxide does not contain any Class I or Class II ozone depleting chemicals (40 CFR Part 82). Nitrous Oxide is not listed as a marine pollutant by DOT (49 CFR Part 171).

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

For emergency disposal, secure the cylinder and slowly discharge gas to the atmosphere in a well ventilated area or outdoors away from all sources of ignition.

14. TRANSPORT INFORMATION

DOT/IMO SHIPPING NAME: Nitrous oxide

HAZARD CLASS: 2.2 (Nonflammable Gas)

IDENTIFICATION NUMBER: UN 1070

[PIN]: 1070

PRODUCT RQ: Not applicable

SHIPPING LABEL(s): Nonflammable Gas and Oxidizer.

STOODY INDUSTRIAL AND WELDING SUPPLY, INC.

PLACARD (When required): Nonflammable gas.

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards and should be discouraged.

15. REGULATORY INFORMATION

The following information concerns selected regulatory requirements potentially applicable to this product. Not all such requirements are identified. Users of this product are responsible for their own regulatory compliance on a federal, state [provincial], and local level.

U.S. FEDERAL REGULATIONS:

EPA - ENVIRONMENTAL PROTECTION AGENCY

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): None

SARA: Superfund Amendment and Reauthorization Act

SECTION 302/304: Requires emergency planning on threshold planning quantities (TPQ) and release reporting based on reportable quantities (RQ) of EPA's extremely hazardous substances (40 CFR Part 355).

Extremely Hazardous Substances: None

Threshold Planning Quantity (TPQ): None

SECTIONS 311/312: Require submission of material safety data sheets (MSDSs) and chemical inventory reporting with identification of EPA defined hazard classes (40 CFR Part 370). The hazard classes for this product are:

IMMEDIATE:	Yes	PRESSURE:	Yes
DELAYED:	Yes	REACTIVITY:	No
		FIRE:	Yes

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Nitrous oxide does not require reporting under Section 313

40 CFR PART 68: Risk Management for Chemical Accidental Release. Requires the development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Nitrous oxide is not listed as a regulated substance.

TSCA: Toxic Substance Control Act: Nitrous oxide is listed on the TSCA inventory.

OSHA - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119: Process Safety Management of Highly Hazardous Chemicals. Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals as listed in Appendix A.

Nitrous oxide is not listed in Appendix A as a highly hazardous chemical.

FDA - FOOD AND DRUG ADMINISTRATION:

21 CFR 184.1545: Generally recognized as safe (GRAS) as a direct human food ingredient when used as a propellant, aerating agent, dairy product analog agent and gas. Nitrous oxide USP is regulated by the FDA as a prescription drug.

[CANADIAN REGULATIONS:]

[Controlled Product Hazard Class A, D2A, C. This MSDS has been prepared in compliance with Controlled Product Regulations.]

16. OTHER INFORMATION

SPECIAL PRECAUTIONS: All gauges, valves, regulators, piping and equipment to be used in nitrous oxide service must be cleaned for oxygen service in accordance with CGA pamphlet G-4.1 Use piping and equipment adequately designed to withstand pressures to be encountered. Nitrous oxide may cause swelling of some elastomers. Use a check valve or other protective apparatus in any line or piping from the cylinder to prevent reverse flow.

Shipment of compressed gas cylinders which have not been filled with the owner's consent is a violation of Federal law (49 CFR Part Part 173.301 (b)).

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

OTHER INFORMATION:

NFPA RATINGS:

HEALTH:	= 2
FLAMMABILITY:	= 0
REACTIVITY:	= 0
SPECIAL:	= OX (Oxidizer)

HMIS RATINGS:

HEALTH:	= 2
FLAMMABILITY:=	0
REACTIVITY:	= 0

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STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED:	0-3000 psig	CGA 326
PIN-INDEXED YOKE:	0-3000 psig	CGA 910 (Medical Use)
ULTRA HIGH INTEGRITY:	0-3000 psig	712

Use the proper CGA connections, DO NOT USE ADAPTERS

Further information about oxygen can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703)412-0900.

G-4.1	<i>Cleaning Equipment for Oxygen Service</i>
G-8.1	<i>Standard for Nitrous Oxide Systems at Consumer Sites</i>
G 8.2	<i>Commodity Specification for Nitrous Oxide</i>
P-1	<i>Safe Handling of Compressed Gases in Containers</i>
SB-2	<i>Oxygen-Deficient Atmospheres</i>
SB-6	<i>Nitrous Oxide Security and Control</i>
AV-1	<i>"Safe Handling and Storage of Compressed Gases"</i>

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