



INTERNATIONAL INDUSTRIAL GASES LTD

Safety Data Sheet

NITROUS OXIDE

Material Safety Data Sheet

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1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: NITROUS OXIDE
Manufacturer's Registered Office: 146 Andul Road, Howrah - 711103, India
Manufacturer's Website: www.iigas.com · www.thegases.com
Telephone Number: (+91 033) 2668 4725

2. HAZARDS IDENTIFICATION

WARNING!

EMERGENCY OVERVIEW

WARNING! Oxidizer — vigorously accelerates combustion. Contact with combustible material may cause fire.

Liquefied gas under pressure.

Anaesthetic at high concentrations — drowsiness, dizziness, unconsciousness.

Contact with liquid or rapidly expanding gas may cause frostbite.

Keep oil, grease and combustibles away. Keep at temperatures below 52°C / 125°F.

Appearance / State / Odor: Colorless | Physical State: Liquefied Compressed Gas | Odor: Slightly sweet

POTENTIAL HEALTH EFFECTS:

Principal Routes of Exposure: Inhalation

Inhalation: Nitrous oxide is an anaesthetic gas. Overexposure causes drowsiness, dizziness, euphoria, loss of coordination and unconsciousness; severe overexposure without adequate oxygen can be fatal. Chronic occupational overexposure has been associated with neurological effects (vitamin-B12 inactivation) and reproductive effects.

Eyes: Contact with liquid or rapidly expanding gas may cause freezing injury.

Skin: Contact with liquid or rapidly expanding gas may cause frostbite.

Ingestion: None under normal use.

Chronic Effects: Prolonged occupational overexposure may affect the nervous system and blood formation (B12 inactivation) and has been associated with adverse reproductive outcomes — control workplace exposure.

Environmental Hazard: See Section 12 for additional Ecological Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS-No	Volume %	Chemical Formula
Nitrous oxide	10024-97-2	>98 (IP grade)	N2O

4. FIRST AID MEASURES

Eye Contact: For frostbite from liquid contact, flush gently with lukewarm water and get medical attention.

Skin Contact: For frostbite, warm the affected area gently with lukewarm water — do not rub. Get medical attention.

Inhalation: Move victim to fresh air immediately. If breathing has stopped, give artificial respiration; qualified personnel may give oxygen. Seek immediate medical attention.

Ingestion: None under normal use.

Notes to Physician: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Flammable Properties: Non-flammable, but a strong oxidizer — vigorously supports and accelerates combustion. Decomposes above ~650 °C releasing oxygen and nitrogen.

Suitable Extinguishing Media: Use extinguishing measures appropriate to local circumstances and the surrounding environment.

Specific Hazards: May ignite combustibles (wood, paper, oil, clothing). Cylinders may rupture under extreme heat; decomposition can accelerate a fire. Continue to cool fire-exposed cylinders until flames are extinguished. Damaged cylinders should be handled only by specialists.

Protective Equipment for Firefighters: SCBA, pressure-demand, NIOSH approved or equivalent, and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Evacuate personnel and ensure adequate ventilation. Eliminate combustible materials from the area. Monitor oxygen and N₂O levels. Stop the flow of gas or remove the cylinder outdoors if this can be done without risk. Return cylinder to IIGAS.

7. HANDLING AND STORAGE

Handling

Keep oil, grease and other combustibles away from cylinders, valves and regulators — use only oxygen/oxidizer-clean equipment. “NO SMOKING” signs should be posted in storage and use areas. Separate from flammable gas cylinders by at least 20 ft or a half-hour-fire-rated barrier 5 ft high. In medical use, ensure scavenging systems control workplace exposure. Medical N₂O is filled to Indian Pharmacopoeia (IP) under the Drugs & Cosmetics Act.

Use only in well-ventilated areas. Never attempt to lift a cylinder by its valve protection cap. Protect cylinders from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for a short distance, use a cart designed to transport cylinders. Use equipment rated for cylinder pressure. Use a backflow preventive device in the piping. Never insert an object (e.g., wrench, screwdriver, pry bar) into valve cap openings — doing so may damage the valve and cause a leak.

Close the valve after each use and when empty. If a user experiences any difficulty operating the cylinder valve, discontinue use and contact the supplier. Never put cylinders into trunks of cars or unventilated areas of passenger vehicles. Never attempt to refill a compressed gas cylinder without the owner’s written consent. Never strike an arc on a compressed gas cylinder or make a cylinder part of an electrical circuit.

For additional recommendations consult rules 18 & 20 of the Gas Cylinder Rules, 2016.

Storage

Protect from physical damage. Cylinders should be stored upright with the valve protection cap in place and firmly secured to prevent falling. Store in a cool, dry, well-ventilated area of non-combustible construction away from high-traffic areas and emergency exits. Keep at temperatures below 52°C / 125°F.

Full and empty cylinders should be segregated. Use a “First-In-First-Out (FIFO)” inventory system to prevent full cylinders from being stored for excessive periods. Always store and handle compressed gas cylinders in accordance with rule 21 of the Gas Cylinder Rules, 2016.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines: ACGIH TLV-TWA: 50 ppm.

Ventilation: Use local exhaust/scavenging with general ventilation to keep N₂O below 50 ppm TWA in clinical and plant areas.

Eye/Face Protection: Safety glasses recommended when handling cylinders.

Skin and Body Protection: Work gloves (clean, free of oil and grease) and safety shoes when handling cylinders.

Respiratory Protection: SCBA or positive-pressure airline for emergency use or high concentrations.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety practices.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colorless
Odor	Slightly sweet
Physical State	Liquefied compressed gas
Molecular Weight	44.01
Boiling Point	-88.5 °C / -127.3 °F
Vapor Density	1.84 kg/m ³ (0.114 lb/ft ³) @ 21.1 °C — heavier than air
Specific Volume @ 21.1 °C & 1 atm	8.73 ft ³ /lb
Critical Temperature	36.4 °C / 97.6 °F
Critical Pressure	1,054 psia
Decomposition Temperature	~650 °C (releases O ₂ + N ₂)
Water Solubility	Soluble
Flammability Limits in Air	Not applicable (oxidizer, non-flammable)

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions. Decomposes exothermically above ~650 °C.

Incompatible Products: Combustible materials, organic materials, oil and grease, reducing agents, flammable gases.

Conditions to Avoid: Heat above 52 °C, open flames, hot surfaces, combustible contamination.

Hazardous Decomposition Products: Oxygen and nitrogen (accelerates fire); nitrogen oxides in flames.

Hazardous Polymerization: Does not occur.

11. TOXICOLOGICAL INFORMATION

Anaesthetic gas: overexposure causes CNS depression and unconsciousness. Chronic overexposure inactivates vitamin B₁₂, with neurological and haematological effects, and has been associated with reproductive effects — observe the 50 ppm TLV. Contains no ingredient listed as a carcinogen.

12. ECOLOGICAL INFORMATION

Ecotoxicity: Will not bioconcentrate. N₂O is a greenhouse gas — avoid unnecessary venting.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container properly labelled, with any valve outlet plugs or caps secured and valve protection cap in place, to IIGAS for proper disposal.

14. TRANSPORT INFORMATION

DOT / ADR

Proper Shipping Name: Nitrous oxide

Hazard Class: 2.2 **Subsidiary Class:** 5.1

UN-Number: UN1070

Description: UN1070, Nitrous oxide, 2.2, (5.1)

Labels: 2.2 Non-flammable gas + 5.1 Oxidizing gas

15. REGULATORY INFORMATION

SARA 311/312 Hazard Categories

Acute Health Hazard: Yes **Chronic Health Hazard:** Yes **Fire Hazard:** Yes

Sudden Release of Pressure Hazard: Yes **Reactive Hazard:** No

Store, transport and handle in accordance with the Gas Cylinder Rules, 2016 and other applicable national / local regulations.

16. OTHER INFORMATION

General: Ensure all national / local regulations are observed.

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