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MATERIAL SAFETY DATA SHEET
435

PRODUCT NAME	CAS #
Nitrous Oxide	10024-97-2
TRADE NAME AND SYNONYMS Nitrous Oxide; Dinitrogen Monoxide; Laughing Gas	DOT I.D. No.: UN 1070
CHEMICAL NAME AND SYNONYMS	DOT Hazard Class: Nonflammable gas
Nitrous Oxide	Formula: N_2O
ISSUE DATE AND REVISIONS	Chemical Family:
25 November 1985	Oxide of nitrogen

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT

None established. It should be considered a simple asphyxiant. Oxygen levels should be maintained at greater than 18 molar percent at normal atmospheric pressure which is equivalent to a partial pressure of 135 mm Hg (ACGIH 1985-86).

SYMPTOMS OF EXPOSURE

Inhalation: High concentrations of nitrous oxide so as to exclude an adequate supply of oxygen to the lungs causes dizziness, deeper breathing due to air hunger, possible nausea and eventual unconsciousness.

It is also employed as an anesthetic when mixed with oxygen. These mixtures are generally 80 molar % N_2O and 20 molar % O_2. (Continued on last page.)

TOXICOLOGICAL PROPERTIES

Nitrous oxide is a slight narcotic but lacks substantial toxicity. Therefore, its major property is the exclusion of an adequate supply of oxygen to the lungs.

RECOMMENDED FIRST AID TREATMENT

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO NITROUS OXIDE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

Inhalation: 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.

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

See last page.

PHYSICAL DATA

BOILING POINT -127.2°F (-88.44°C)	LIQUID DENSITY AT BOILING POINT 76.8 lb/ft^3 (1230 kg/m^3)
VAPOR PRESSURE @ 70°F (21.1°C): 754 psia (5200 kPa)	GAS DENSITY AT 70°F, 1 atm 0.1146 lb/ft^3 (1.836 kg/m^3)
SOLUBILITY IN WATER Slightly soluble	FREEZING POINT -131.6°F (-90.9°C)
EVAPORATION RATE N/A	SPECIFIC GRAVITY (AIR=1) @ 70°F (21.1°C) = 1.53
APPEARANCE AND ODOR Colorless gas with slightly sweet taste and odor.	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) N/A	AUTO IGNITION TEMPERATURE N/A	FLAMMAGLE LIMITS % BY VOLUME LEL N/A UEL N/A
EXTINGUISHING MEDIA Copious quantities of water for fires with nitrous oxide as the oxidizer.		ELECTRICAL CLASSIFICATION Nonhazardous
SPECIAL FIRE FIGHTING PROCEDURES If possible, stop the flow of nitrous oxide which is supporting the fire.		
UNUSUAL FIRE AND EXPLOSION HAZARDS N/A		

REACTIVITY DATA

STABILITY Unstable		CONDITIONS TO AVOID N/A
Stable	X	
INCOMPATIBILITY (Materials to avoid) All flammable materials		
HAZARDOUS DECOMPOSITION PRODUCTS None		
HAZARDOUS POLYMERIZATION May Occur		CONDITIONS TO AVOID N/A
Will Not Occur	X	

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, contact your closest supplier location or call the emergency telephone number listed herein.

WASTE DISPOSAL METHOD Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve plugs or caps secured and valve outlet plugs or caps secured and valve protection cap in place to your supplier. For emergency disposal assistance, contact your closest supplier location or call the emergency telephone number listed herein.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.

VENTILATION	LOCAL EXHAUST	SPECIAL
See Local Exhaust on last page.	See last page.	N/A
	MECHANICAL (Gen.) N/A	OTHER N/A

PROTECTIVE GLOVES

Any material

EYE PROTECTION

Safety goggles or glasses

OTHER PROTECTIVE EQUIPMENT

Safety shoes

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION

DOT Shipping Name: Nitrous oxide or Nitrous oxide, compressed I.D. No.: UN 1070
DOT Shipping Label: Nonflammable gas DOT Hazard Class: Nonflammable gas

SPECIAL HANDLING RECOMMENDATIONS

Use only in well-ventilated areas. Valve protection caps and valve outlet threaded plugs 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 (<1500 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 cylinder.

For additional handling recommendations, consult Compressed Gas Association's pamphlets P-1, P-2, P-14, and Safety Bulletins SB-2 and SB-6.

SPECIAL STORAGE RECOMMENDATIONS

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits and away from full or empty stored cylinders which contain flammable products. Do not allow the temperature where cylinders are stored to exceed 130F (54C). 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 pamphlets P-1, P-2, P-14 and Safety Bulletins SB-2 and SB-6.

SPECIAL PACKAGING RECOMMENDATIONS

Nitrous oxide is noncorrosive and may be used with any common structural material. Nitrous oxide oxidizes some metals at elevated temperatures.

OTHER RECOMMENDATIONS OR PRECAUTIONS

Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with his (written) consent is a violation of Federal Law (49CFR).

*Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.

SYMPTOMS OF EXPOSURE: (Continued)

The laughter effects seem to occur after incipient asphyxia accompanied by the sudden return of adequate oxygen as in the air.

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES: (Continued)

Nitrous oxide will serve as the oxidant for most flammable compounds. Some flammables (generally allenes) have a lower lower flammable limit in nitrous oxide than in pure oxygen.

Powerful reducing agents will react violently with nitrous oxide at room temperatures.

LOCAL EXHAUST: (Continued)

To prevent accumulation of high concentrations so as to reduce the oxygen level in the air to less than 18 molar percent.