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MATERIAL SAFETY DATA SHEET

No. 167

PRODUCT NAME Less Than 23.5% Oxygen in Nitrogen	CAS # O ₂ = 7782-42-7 N ₂ = 7727-37-9
TRADE NAME AND SYNONYMS Compressed Gas, N.O.S. (D.O.T.)	DOT I.D. No.: UN 1956
CHEMICAL NAME AND SYNONYMS <23.5 Molar % O ₂ in N ₂	DOT Hazard Class: Division 2.2
ISSUE DATES AND REVISIONS January 1997	Formula <23.5 Molar % O ₂ in N ₂
	Chemical Family: Gas Mixtures

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT Nitrogen is a simple asphyxiant (ACGIH 1996); and Oxygen is the "vital element" in the atmosphere in which we live and breathe. OSHA 1996 does not list a PEL (8 hr. TWA) for Nitrogen or Oxygen. (Continued on Page 4)
SYMPTOMS OF EXPOSURE Effects of exposure to high concentrations so as to displace the oxygen in air necessary for life may include <u>any</u> , <u>all</u> or <u>none</u> of the following: <ul style="list-style-type: none"> • Loss of balance or dizziness • Tightness in the frontal area of the forehead (Continued on Page 4)
TOXICOLOGICAL PROPERTIES These mixtures are nontoxic but the liberation of a large amount in a confined area could displace the amount of oxygen in air necessary to support life. Neither oxygen or nitrogen is listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen. Persons in ill health where such illness would be aggravated by exposure to these mixtures should not be allowed to work with or handle these products.
RECOMMENDED FIRST AID TREATMENT PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO THESE MIXTURES. 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 assisted respiration and supplemental oxygen. Further treatment should be symptomatic and supportive.

Information contained in this material safety data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information is not intended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering any process, composition of matter or use. Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or damage incurred from the proper or improper use of such product.

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

None

PHYSICAL DATA

BOILING POINT O ₂ = -297.3°F (-182.9°C) N ₂ = -320.5°F (-195.8°C)	LIQUID DENSITY AT BOILING POINT See Page 4
VAPOR PRESSURE See Page 4	GAS DENSITY AT 70°F, 1 atm O ₂ =.0828 lb/ft ³ (1.326kg/m ³) N ₂ =.0725 lb/ft ³ (1.161kg/m ³)
SOLUBILITY IN WATER O ₂ Slightly N ₂ Very slightly	FREEZING POINT N ₂ = -345.9°F (-209.9°C)
EVAPORATION RATE N/A (Gas)	SPECIFIC GRAVITY (AIR=1) O ₂ @ 70°F (21.1°C)=1.11 N ₂ @ 70° F (21.1°C)=0.97
APPEARANCE AND ODOR Colorless, odorless gas	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) N/A	AUTO IGNITION TEMPERATURE N/A	FLAMMABLE LIMITS % BY VOLUME (See Page 4) LE N/A UEL N/A
EXTINGUISHING MEDIA Nonflammable, inert gas		ELECTRICAL CLASSIFICATION Nonhazardous
SPECIAL FIRE FIGHTING PROCEDURES If cylinders are involved in a fire, safely relocate or keep cool with water spray.		
UNUSUAL FIRE AND EXPLOSION HAZARDS None		

REACTIVITY DATA

STABILITY Unstable		CONDITIONS TO AVOID None
Stable	X	
INCOMPATIBILITY (Materials to avoid) None		
HAZARDOUS DECOMPOSITION PRODUCTS None		
HAZARDOUS POLYMERIZATION May Occur		CONDITIONS TO AVOID
Will Not Occur	X	None

SPILL OR LEAK PROCEDURES**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

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

Less than 23.5% Oxygen in Nitrogen

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 See Local Exhaust	LOCAL EXHAUST See Page 4	SPECIAL	N/A
	MECHANICAL (Gen.)	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: Compressed gas, n.o.s DOT Hazard Glass: Division 2.2 DOT Shipping Label: Nonflammable Gas I.D. No.: Un 1956
SPECIAL HANDLING RECOMMENDATIONS Use only in well-ventilated areas. Valve protection caps must remain in place unless cylinder 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 (<3,000 psig) or piping systems. Do not heat cylinder by any means to increase the discharge rate of product from cylinder Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.
SPECIAL STORAGE RECOMMENDATIONS Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125F (52C). 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-9, P-14, and Safety Bulletin SB-2.
SPECIAL PACKAGING RECOMMENDATIONS These mixtures are noncorrosive and may be used with any common structural materials.
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). (Continued on Page 4)

*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.

ACETYLENE

Less Than 23.5 % Oxygen in Nitrogen

HEALTH HAZARD DATA

Note re HEALTH HAZARD DATA: These data and most of the other data in this document are for Oxygen/Nitrogen Mixtures where the Oxygen content is LESS THAN 18 MOLAR%. For mixtures with greater than 1~3 Molar % Oxygen (and Less Than 23.5% Oxygen), See AGA's Material Safety Data Sheet Number 2; "Compressed Air".

TIME WEIGHTED AVERAGE EXPOSURE LIMIT: (Continued)

Oxygen levels should be maintained at greater than 18 Molar% at normal atmospheric pressure (pO₂>135 torr).

SYMPTOMS OF EXPOSURE: (Continued)

- Tingling of the tongue, fingertips or toes
- Weakened speech leading to inability to utter sounds
- Rapid reduction in the ability to perform movements
- Reduced consciousness of the surroundings
- Loss of tactile sensations
- Heightened mental activity

It should be recognized that it is possible that none of the above symptoms may occur in gas asphyxia so that there are no definite warning symptoms.

PHYSICAL DATA: (Continued)

VAPOR PRESSURE @70°F, (21.1°C) O₂= Above the critical temp.of -181.1°F (-118.4°C)
N₂= Above the critical temp. of -232.6°F (-147°C)

LIQUID DENSITY AT BOILING POINT: O₂= 71.23 lb/ft³ (1141 kg/m³)
N₂= 50.46 lb/ft³ (808.3 kg/m³)

SPECIAL PROTECTION INFORMATION

LOCAL EXHAUST:

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

SPECIAL PRECAUTIONS

OTHER RECOMMENDATIONS OR PRECAUTIONS: (Continued)

Always secure cylinders in an upright position before transporting them. transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

Reporting under SARA, Title III, Section 313 not required.

NFPA 704 NO. for these mixtures = 1 -O O None