

## Praxair Material Safety Data Sheet

### 1. Chemical Product and Company Identification

<b>Product Name:</b> Nitrogen, compressed (MSDS No. P-4631-G)	<b>Trade Name:</b> Nitrogen, Medipure™ Nitrogen
<b>Chemical Name:</b> Nitrogen	<b>Synonyms:</b> Dinitrogen
<b>Formula:</b> N <sub>2</sub>	<b>Chemical Family:</b> Permanent gas
<b>Telephone:</b>	<b>Company Name:</b> Praxair, Inc.
<b>Emergencies:</b> 1-800-645-4633*	39 Old Ridgebury Road
<b>CHEMTREC:</b> 1-800-424-9300*	Danbury, CT 06810-5113
<b>Routine:</b> 1-800-PRAXAIR	

\* Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier, Praxair sales representative, or call 1-800-PRAXAIR (1-800-772-9247).

### 2. Composition/Information on Ingredients

See section 16 for important information about mixtures.

INGREDIENT	CAS NUMBER	CONCENTRATION	OSHA PEL	ACGIH TLV-TWA (2004)
Nitrogen	7727-37-9	>99%*	None currently established	Simple asphyxiant

\* The symbol > means "greater than."

### 3. Hazards Identification

#### EMERGENCY OVERVIEW

**CAUTION! High-pressure gas.  
Can cause rapid suffocation.  
May cause dizziness and drowsiness.  
Self-contained breathing apparatus may be required by rescue workers.  
Odor: None**

**THRESHOLD LIMIT VALUE:** TLV-TWA, simple asphyxiant (ACGIH, 2004). TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

**EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:**

**INHALATION**–Asphyxiant. Effects are due to lack of oxygen. Moderate concentrations may cause headache, drowsiness, dizziness, excitation, excess salivation, vomiting, and unconsciousness. Lack of oxygen can kill.

**SKIN CONTACT**–No harm expected.

**SWALLOWING**–An unlikely route of exposure. This product is a gas at normal temperature and pressure.

**EYE CONTACT**–No harm expected.

**EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE:** No harm expected.

**OTHER EFFECTS OF OVEREXPOSURE:** Asphyxiant. Lack of oxygen can kill.

**MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:** The toxicology and the physical and chemical properties of nitrogen suggest that overexposure is unlikely to aggravate existing medical conditions.

**SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:** None known.

**CARCINOGENICITY:** Nitrogen is not listed by NTP, OSHA, or IARC.

<b>4. First Aid Measures</b>
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**INHALATION:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

**SKIN CONTACT:** Flush with water. If discomfort persists, seek medical attention.

**SWALLOWING:** An unlikely route of exposure. This product is a gas at normal temperature and pressure.

**EYE CONTACT:** Flush eyes thoroughly with water. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. If discomfort persists, seek medical attention.

**NOTES TO PHYSICIAN:** *There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.*

<b>5. Fire Fighting Measures</b>
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<b>FLASH POINT</b> (test method):	Not applicable
<b>AUTOIGNITION TEMPERATURE:</b>	Not applicable
<b>FLAMMABLE LIMITS IN AIR</b> , % by volume:	<b>LOWER:</b> Not applicable   <b>UPPER:</b> Not applicable
<b>EXTINGUISHING MEDIA:</b> Nitrogen cannot catch fire. Use media appropriate for surrounding fire.	

**SPECIAL FIRE FIGHTING PROCEDURES: CAUTION! High-pressure gas.** Asphyxiant. Lack of oxygen can kill. Evacuate all personnel from danger area. Immediately deluge cylinders with water from maximum distance until cool; then move them away from fire area if without risk. Shut off flow if you can do so without risk. Self-contained breathing apparatus may be required by rescue workers. (See section 16.) On-site fire brigades must comply with OSHA 29 CFR 1910.156.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** Heat of fire can build pressure in cylinder and cause it to rupture. No part of cylinder should be subjected to a temperature higher than 125°F (52°C). Nitrogen cylinders are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.)

**HAZARDOUS COMBUSTION PRODUCTS:** Not applicable.

## 6. Accidental Release Measures

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: CAUTION! High-pressure gas.** Asphyxiant. Lack of oxygen can kill. Evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Shut off flow if you can do so without risk. Ventilate area or move cylinder to a well-ventilated area. Test for sufficient oxygen, especially in confined spaces, before allowing reentry.

**WASTE DISPOSAL METHOD:** Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

## 7. Handling and Storage

**PRECAUTIONS TO BE TAKEN IN STORAGE:** Store and use with adequate ventilation. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 125°F (52°C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

**PRECAUTIONS TO BE TAKEN IN HANDLING:** Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. If valve is hard to open, discontinue use and contact your supplier. For other precautions in using nitrogen, see section 16.

For additional information on storage and handling, refer to Compressed Gas Association (CGA) pamphlet P-1, *Safe Handling of Compressed Gases in Containers*, available from the CGA. Refer to section 16 for the address and phone number along with a list of other available publications.

## 8. Exposure Controls/Personal Protection

### VENTILATION/ENGINEERING CONTROLS:

**LOCAL EXHAUST**—Use a local exhaust system, if necessary, to prevent oxygen deficiency.

**MECHANICAL (general)**—General exhaust ventilation may be acceptable if it can maintain an adequate supply of air.

**SPECIAL**—None

**OTHER**—None

**RESPIRATORY PROTECTION:** None required under normal use. Air-supplied respirators must be used in confined spaces or in an oxygen-deficient atmosphere. Respiratory protection must conform to OSHA rules as specified in 29 CFR 1910.134. Select in accordance with 29 CFR 1910.134 and ANSI Z88.2.

**SKIN PROTECTION:** Wear work gloves when handling cylinders.

**EYE PROTECTION:** Wear safety glasses when handling cylinders. Select in accordance with OSHA 29 CFR 1910.133.

**OTHER PROTECTIVE EQUIPMENT:** Metatarsal shoes for cylinder handling. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133. Regardless of protective equipment, never touch live electrical parts.

### 9. Physical and Chemical Properties

<b>MOLECULAR WEIGHT:</b>	28.01
<b>SPECIFIC GRAVITY</b> (air = 1) at 70°F (21.1°C) and 1 atm:	0.967
<b>GAS DENSITY</b> at 70°F (21.1°C) and 1 atm:	0.072 lb/ft <sup>3</sup> (1.153 kg/m <sup>3</sup> )
<b>SOLUBILITY IN WATER</b> , vol/vol at 32°F (0°C) and 1 atm:	0.023
<b>PERCENT VOLATILES BY VOLUME:</b>	100
<b>BOILING POINT</b> at 1 atm:	-320.44°F (-195.80°C)
<b>MELTING POINT</b> at 1 atm:	-345.8°F (-209.9°C)

**APPEARANCE, ODOR, AND STATE:** Colorless, odorless, tasteless gas at normal temperature and pressure.

### 10. Stability and Reactivity

**STABILITY:**  Unstable  Stable

**INCOMPATIBILITY (materials to avoid):** None known.

**HAZARDOUS DECOMPOSITION PRODUCTS:** None known.

**HAZARDOUS POLYMERIZATION:**  May Occur  Will Not Occur

**CONDITIONS TO AVOID:** Under certain conditions, nitrogen can react violently with lithium, neodymium, titanium [above 1472°F (800°C)], and magnesium to form nitrides. At high temperature it can also combine with oxygen and hydrogen.

### 11. Toxicological Information

Nitrogen is a simple asphyxiant.

### 12. Ecological Information

No adverse ecological effects expected. Nitrogen does not contain any Class I or Class II ozone-depleting chemicals. Nitrogen is not listed as a marine pollutant by DOT.

### 13. Disposal Considerations

**WASTE DISPOSAL METHOD:** Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier. For emergency disposal, secure cylinder in a well-ventilated area or outdoors, and then slowly discharge gas to the atmosphere.

<b>14. Transport Information</b>
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**DOT/IMO SHIPPING NAME:** Nitrogen, compressed

<b>HAZARD CLASS:</b> 2.2	<b>IDENTIFICATION NUMBER:</b> UN 1066	<b>PRODUCT RQ:</b> None
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**SHIPPING LABEL(s):** NONFLAMMABLE GAS

**PLACARD (when required):** NONFLAMMABLE GAS

**SPECIAL SHIPPING INFORMATION:** Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of a vehicle can present serious safety hazards.

Shipment of compressed gas cylinders that have been filled without the owner's consent is a violation of federal law [49 CFR 173.301(b)].

<b>15. Regulatory Information</b>
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The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

**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:

**SECTIONS 302/304:** Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of Extremely Hazardous Substances (EHS) (40 CFR Part 355):

**TPQ:** None

**EHS RQ:** None

**SECTIONS 311/312:** Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:

**IMMEDIATE:** No

**PRESSURE:** Yes

**DELAYED:** No

**REACTIVITY:** No

**FIRE:** No

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

Nitrogen does not require reporting under Section 313.

**40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION:** Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Nitrogen is not listed as a regulated substance.

**TSCA: TOXIC SUBSTANCES CONTROL ACT:** Nitrogen 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.

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

#### STATE REGULATIONS:

**CALIFORNIA:** Nitrogen is not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

**PENNSYLVANIA:** Nitrogen is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

### 16. Other Information

Be sure to read and understand all labels and instructions supplied with all containers of this product.

**NOTE:** *The suitability of nitrogen as a component in underwater breathing gas mixtures is to be determined by or under the supervision of personnel experienced in the use of underwater breathing gas mixtures and familiar with the physiological effects, methods employed, frequency and duration of use, hazards, side effects, and precautions to be taken.*

**OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE:** *High-pressure gas.* Use piping and equipment adequately designed to withstand pressures to be encountered. *Gas can cause rapid suffocation due to oxygen deficiency.* Store and use with adequate ventilation. Close valve after each use; keep closed even when empty. *Never work on a pressurized system.* If there is a leak, close the cylinder valve. Blow the system down in a safe and environmentally sound manner in compliance with all federal, state, and local laws; then repair the leak. *Never place a compressed gas cylinder where it may become part of an electrical circuit.*

**MIXTURES:** When you mix two or more gases or liquefied gases, you can 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 evaluate the end product. Remember, gases and liquids have properties that can cause serious injury or death.

#### HAZARD RATING SYSTEMS:

##### NFPA RATINGS:

HEALTH = 0  
 FLAMMABILITY = 0  
 INSTABILITY = 0  
 SPECIAL = SA (CGA recommends this to designate Simple Asphyxiant.)

##### HMIS RATINGS:

HEALTH = 0  
 FLAMMABILITY = 0  
 PHYSICAL HAZARD = 3

**STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:**

<b>THREADED:</b>	0-3000 psig	CGA-580
	3001-5500 psig	CGA-680
	5001-7500 psig	CGA-677
<b>PIN-INDEXED YOKE:</b>	0-3000 psig	CGA-960 (medical use)
<b>ULTRA-HIGH-INTEGRITY CONNECTION:</b>	0-3000 psig	CGA-718

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlet V-1 listed below.

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information about this product can be found in the following pamphlets published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5<sup>th</sup> Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, <http://www.cganet.com/Publication.asp>.

AV-1	<i>Safe Handling and Storage of Compressed Gases</i>
G-10.1	<i>Commodity Specification for Nitrogen</i>
P-1	<i>Safe Handling of Compressed Gases in Containers</i>
P-9	<i>Inert Gases – Argon, Nitrogen, and Helium</i>
SB-2	<i>Oxygen-Deficient Atmospheres</i>
V-1	<i>Compressed Gas Cylinder Valve Inlet and Outlet Connections</i>
—	<i>Handbook of Compressed Gases, Fourth Edition</i>

Praxair asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

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The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

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