

## Praxair Material Safety Data Sheet

### 1. Chemical Product and Company Identification

<b>Product Name:</b> Inert Gas//Nitric Oxide Mixture	<b>Trade Name:</b> Inert Gas//Nitric Oxide Mixture
<b>Product Use:</b> Many.	
<b>Chemical Name:</b> Not applicable.	<b>Synonym:</b> Not applicable.
<b>Chemical Formula:</b> Not applicable.	<b>Chemical Family:</b> Not applicable.
<b>Telephone:</b> <b>Emergencies:</b> * 1-800-363-0042	<b>Supplier /Manufacture:</b> Praxair Canada Inc. 1 City Centre Drive Suite 1200 Mississauga, ON L5B 1M2  <b>Phone:</b> 905-803-1600 <b>Fax:</b> 905-803-1682

*\*Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Praxair sales representative.*

### 2. Composition and Information on Ingredients

INGREDIENTS	% (VOL)	CAS NUMBER	LD <sub>50</sub> (Species & Routes)	LC <sub>50</sub> (Rat, 4 hrs.)	TLV-TWA (ACGIH)
Nitric oxide AND/OR ONE OR MORE OF THE FOLLOWING GASES:	0.0001 - 0.9999	10102-43-9	Not applic.	7 ppm	25 ppm
Argon	Balance	7440-37-1	Not applic.	Not available.	Simple asphyxiant.
Helium	Balance	7440-59-7	Not applic.	Not available.	Simple asphyxiant.
Krypton	Balance	7439-90-9	Not applic.	Not available.	Simple asphyxiant.
Neon	Balance	7440-01-9	Not applic.	Not available.	Simple asphyxiant.
Nitrogen	Balance	7727-37-9	Not applic.	Not available.	Simple asphyxiant.
Xenon	Balance	7740-63-3	Not applic.	Not available.	Simple asphyxiant.

### 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.

**ROUTES OF EXPOSURE:**                      Inhalation.

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

**INHALATION:** Asphyxiant. Effects are due to lack of oxygen. Moderate concentrations may cause headaches, drowsiness, dizziness, excitation, excess salivation, vomiting, and unconsciousness. Lack of oxygen can kill. Mixture contains traces of nitrogen dioxide.

**SKIN CONTACT:** No harm expected from vapour.

**SKIN ABSORPTION:** No evidence of adverse effects from available information.

**SWALLOWING:** This product is a gas at normal temperature and pressure.

**EYE CONTACT:** No harmful effect expected from vapour.

**EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE:**

Not available.

**OTHER EFFECTS OF OVEREXPOSURE:**

Contact with the liquid can cause frostbite.

**MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:**

The toxicology and the physical and chemical properties of this product suggest that overexposure is unlikely to aggravate medical condition.

**SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:**

Not available - mixture not tested.

**CARCINOGENICITY:**

Not listed as carcinogen by OSHA, NTP or IARC.

**4. First Aid Measures**

**INHALATION:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**SKIN CONTACT:**

Immediately flush affected areas with water for at least 15 minutes while removing contaminated clothing and shoes. Discard clothing and shoes. Call a physician.

**SWALLOWING:**

This product is a gas at normal temperature and pressure.

**EYE CONTACT:**

Flush with water. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. See a physician, preferably an ophthalmologist, immediately.

**NOTES TO PHYSICIAN:**

*There is no specific antidote. Treatment of over-exposure should be directed at the control of symptoms and the clinical condition.*

**5. Fire Fighting Measures**

**FLAMMABLE :** No. **IF YES, UNDER WHAT CONDITIONS?** Not applicable.

**FLASH POINT (test method)** Not applicable. **AUTOIGNITION TEMPERATURE** Not applicable.

**FLAMMABLE LIMITS IN AIR, % by volume:** **LOWER:** Not applicable. **UPPER:** Not applicable.

#### EXTINGUISHING MEDIA:

This mixture cannot catch fire. Use media appropriate for surrounding fire.

#### SPECIAL FIRE FIGHTING PROCEDURES:

**CAUTION! High-pressure gas.** May be harmful if inhaled. 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. Self-contained breathing apparatus may be required by rescue workers.

#### UNUSUAL FIRE AND EXPLOSION HAZARD:

Nonflammable material. This material cannot catch fire. Container may rupture due to heat of fire. No part of a container should be subjected to temperature higher than 52 C. Most containers are provided with a pressure relief device designed to vent contents when they are exposed to elevated temperature. Toxic fumes may be produced when heated.

#### HAZARDOUS COMBUSTION PRODUCTS:

None.

#### SENSITIVITY TO IMPACT:

Avoid impact against container.

#### SENSITIVITY TO STATIC DISCHARGE:

Not applicable.

### 6. Accidental Release Measures

#### STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

**CAUTION!** Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Reduce vapours with fog or fine water spray. Reverse flow into cylinder may cause rupture. Shut off leak if without risk. Ventilate area of leak or move leaking container to well ventilated area. Prevent runoff from contaminating surrounding environment. Corrosive vapours may spread from spill. Before entering area, especially confined areas, check atmosphere with appropriate device.

#### 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, provincial, 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. Separate flammable cylinders from oxygen, chlorine, and other oxidizers by at least 6 m or use a barricade of non-combustible material. This barricade should be at least 1.5 m high and have a fire resistance rating of at least ½ hour. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Post "No Smoking or Open Flames" signs in storage and use areas. There must be no sources of ignition. All electrical equipment in storage areas must be explosion-proof. Storage areas must meet national electric codes for Class 1 hazardous areas. Store only where temperature will not exceed 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, 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.

**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. **Prevent reverse flow.** Reverse flow into cylinder may cause rupture. Use a check valve or other protective device in any line or piping from the cylinder. **When returning cylinder to supplier,** be sure valve is closed, then install valve outlet plug tightly. **Never work on pressurized system.** If there is a leak, close the cylinder valve. Vent the system down in a safe and environmentally sound manner in compliance with all federal, provincial, and local laws; then repair the leak. **Never place a compressed gas cylinder where it may become part of an electrical circuit.**

**8. Exposure Controls/Personal Protection**

**VENTILATION/ENGINEERING CONTROLS:**

**LOCAL EXHAUST:** Preferred.

**MECHANICAL (general):** Acceptable.

**SPECIAL:** Not applicable.

**OTHER:** Not applicable.

**PERSONAL PROTECTION:**

**RESPIRATORY PROTECTION:** For concentrations up to 10 times the applicable exposure limit any NIOSH/MSHA approved supplied air respirator is recommended. Up to 50 times the TLV, a NIOSH/MSHA approved respirator with a full-face piece or self-contained breathing apparatus is recommended. For higher concentration us only self-contained breathing apparatus operated in the pressure demand mode.

Selection should also be based on the current CSA standard Z94.4, "Selection, Care and Use of Respirators". Respirators should also be approved by NIOSH and MSHA.

**SKIN PROTECTION:** Preferred for cylinder handling.

**EYE PROTECTION:** Wear safety glasses when handling cylinders.

Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

**OTHER PROTECTIVE EQUIPMENT:** Metatarsal shoes for cylinder handling. Protective clothing where needed. Cuffless trousers should be worn outside the shoes. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines.

**9. Physical and Chemical Properties**

Product Name: Inert Gas//Nitric Oxide Mixture

MSDS# E-6782-F

Date: Oct. 15, 2016

<b>PHYSICAL STATE:</b> Gas.	<b>FREEZING POINT:</b> Not available - mixture not tested.	<b>pH:</b> Not applicable.
<b>BOILING POINT:</b> Not available - mixture not tested.	<b>VAPOUR PRESSURE:</b> Gas.	<b>MOLECULAR WEIGHT:</b> Not applicable.
<b>SPECIFIC GRAVITY: LIQUID ( Water = 1)</b> : Not available.	<b>SOLUBILITY IN WATER,</b> : Not available - mixture not tested.	
<b>SPECIFIC GRAVITY: VAPOUR (air = 1)</b> : Not available - mixture not tested.	<b>EVAPORATION RATE (Butyl Acetate=1):</b> : Not available.	<b>COEFFICIENT OF WATER/OIL DISTRIBUTION:</b> : Not applicable.
<b>VAPOUR DENSITY:</b> Not available - mixture not tested.	<b>% VOLATILES BY VOLUME:</b> : Not available.	<b>ODOUR THRESHOLD:</b> : Not available.
<b>APPEARANCE &amp; ODOUR:</b> Colourless. Odourless gas		

### 10. Stability and Reactivity

<b>STABILITY:</b>	The product is stable.
<b>CONDITIONS OF CHEMICAL INSTABILITY:</b>	Temperatures in excess of 160 C.
<b>INCOMPATIBILITY (materials to avoid):</b>	Under certain conditions, gas can react violently with lithium, neodymium, titanium, ozone.
<b>HAZARDOUS DECOMPOSITION PRODUCTS:</b>	None.
<b>HAZARDOUS POLYMERIZATION:</b>	None.
<b>CONDITIONS OF REACTIVITY:</b>	None currently known.

### 11. Toxicological Information

See section 3.

### 12. Ecological Information

No adverse ecological effects expected. This product does not contain any Class I or Class II ozone-depleting chemicals. The components of this mixture are not listed as marine pollutants by TDG Regulations.

### 13. Disposal Considerations

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

### 14. Transport Information

**TDG/IMO SHIPPING NAME:** Compressed gas, n.o.s. (name of the most important inert component).

<b>HAZARD CLASS:</b> CLASS 2.2: Non-flammable, non-corrosive and non-toxic.	<b>IDENTIFICATION #:</b> UN1956	<b>PRODUCT RQ:</b> Any accidental release in a quantity that could pose a danger to public safety or any sustained release of 10 minutes or more
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**SHIPPING LABEL(s):** Non-flammable, non-corrosive and non-toxic gas

Product Name: Inert Gas//Nitric Oxide  
Mixture

MSDS# E-6782-G

Date: Oct. 15, 2016

**PLACARD (when required):** Non-flammable, non-corrosive and non-toxic gas

**SPECIAL SHIPPING INFORMATION:**

Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, non-ventilated compartment of a vehicle can present serious safety hazards.

**15. Regulatory Information**

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, provincial, and local regulations.

**DSL (Canada)** This product is on the DSL list

**WHMIS (Canada)** CLASS A: Compressed gas.

**International Regulations**

**EINECS** Not available.

**DSCL (EEC)** R20- Harmful by inhalation.

**International Lists** No products were found.

**16. Other Information**

**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.

**HAZARD RATING SYSTEM:**

**HMIS RATINGS:**

HEALTH 0

FLAMMABILITY 0

PHYSICAL HAZARD 2

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

**THREADED:** CGA-660

**PIN-INDEXED YOKE:** Not available.

**ULTRA-HIGH-INTEGRITY CONNECTION:** Not available.

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlets V-1 and V-7 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, 5th Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, Fax (703) 961-1831, website: www.cganet.com.

**Product Name:** Inert Gas//Nitric Oxide  
Mixture

**MSDS#** E-6782-G

**Date:** Oct. 15, 2016

AV-1 Safe Handling and Storage of Compressed Gas  
P-1 Safe Handling of Compressed Gases in Containers  
P-9 Inert Gases - Argon, Nitrogen, and Helium  
P-14 Accident Prevention in Oxygen-Rich, Oxygen-Deficient Atmosphere  
SB-2 Oxygen-Deficient Atmospheres  
V-1 Compressed Gas Cylinder Valve Inlet and Outlet Connections  
V-7 Standard Method of Determining Cylinder Valve Outlet Connections for Industrial Gas Mixtures  
--- Handbook of Compressed Gases, Fifth Edition

**For more indepth information for each component, refer to the pure product MSDS.**

**The information contained in this MSDS is generated from technical sources using the Chemmate Mixture MSDS system and the pure-product MSDS for each component. These mixtures are not tested as a whole for chemical, physical, or health effects.**

**PREPARATION INFORMATION:**

**DATE:** October 15, 2016  
**DEPARTMENT:** Safety and Environmental Services  
**TELEPHONE:** 905-803-1600

The opinions expressed herein are those of qualified experts within Praxair Canada 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 Canada Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair Canada Inc. requests the users of this product to study this Material Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety nformation, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

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