

### SECTION: 1. Product and company identification

#### 1.1. Product identifier

Product form : Mixture  
 Product name : PTG-4143  
 Formula : (0.0001 - 0.5 %) Nitric Oxide, (0.0001 - 0.5 %) Nitrogen Dioxide in Nitrogen.

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Calibration / Reference  
 Use of the substance/mixture : Industrial use; Use as directed.

#### 1.3. Details of the supplier of the safety data sheet

Manufactured For:	By:
Scientific Gas Australia Pty Ltd.	PortaGas (Praxair, Inc.)
Unit 10, 12 Anderson Street	1202 E Sam Houston Pkwy S
Bankstown NSW, 2019 - Australia	Pasadena, TX 77503
T PH 1300 880 531	T 281-928-6477

#### 1.4. Emergency telephone number

**Emergency number** : Onsite Emergencies: 1-800-645-4633; Australian Poison Information Centre: 13 11 26;  
 Australian Fire Brigade: 000  
 CHEMTREC: USA 1-800-424-9300, International 001-703-527-3887 (Collect calls accepted, contract 17729)

### SECTION 2: Hazard identification

#### 2.1. Classification of the substance or mixture

**Classification (GHS-AU)**  
 Press. Gas (Comp.) H280

#### 2.2. Label elements

##### GHS AU labelling

Hazard pictograms (GHS-AU) :



GHS04

Signal word (GHS-AU) : WARNING  
 Hazard statements (GHS AU) : H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED  
 OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.  
 Precautionary statements (GHS-AU) : P403 - Use and store only outdoors or in a well-ventilated place.  
 CGA-PG27 - Read and follow the Safety Data Sheet (SDS) before use.  
 CGA-PG21 - Open valve slowly.  
 CGA-PG12 - Do not open valve until connected to equipment prepared for use.  
 CGA-PG11 - Never put cylinders into unventilated areas of passenger vehicles.  
 CGA-PG10 - Use only with equipment rated for cylinder pressure.  
 CGA-PG06 - Close valve after each use and when empty.  
 CGA-PG05 - Use a back flow preventive device in the piping.  
 CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F).  
 CGA-MP01 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention.  
 P261 - Avoid breathing gas, vapors

#### 2.3. Other hazards

No additional information available

**2.4. Unknown acute toxicity (GHS US)**

No data available

**SECTION 3: Composition/Information on ingredients**

**3.1. Substance**

Not applicable

**3.2. Mixture**

Name	Product identifier	%
Nitrogen	(CAS No) 7727-37-9	99.8 - 100
Nitric oxide	(CAS No) 10102-43-9	0.0001 - 0.1
Nitrogen dioxide	(CAS No) 10102-44-0	0.0001 - 0.1

**SECTION 4: First aid measures**

**4.1. Description of first aid measures**

- First-aid measures after inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped. Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.
- First-aid measures after skin contact : Adverse effects not expected from this product.
- First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.
- First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

**4.2. Most important symptoms and effects, both acute and delayed**

No additional information available

**4.3. Indication of any immediate medical attention and special treatment needed**

Obtain medical assistance.

**SECTION 5: Firefighting measures**

**5.1. Extinguishing media**

- Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.
- HazChem code : 2TE.

**5.2. Special hazards arising from the substance or mixture**

- Reactivity : No reactivity hazard other than the effects described in sub-sections below.

**5.3. Advice for firefighters**

- Firefighting instructions : Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with their provincial and local fire regulations.
- Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

**SECTION 6: Accidental release measures**

**6.1. Personal precautions, protective equipment and emergency procedures**

- General measures : Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Ensure adequate air ventilation. Evacuate area. Try to stop release. Monitor concentration of released product.

**6.1.1. For non-emergency personnel**

- Emergency procedures : Evacuate unnecessary personnel.

**6.1.2. For emergency responders**

No additional information available

**6.2. Environmental precautions**

Try to stop release. Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

**6.3. Methods and material for containment and cleaning up**

No additional information available

**6.4. Reference to other sections**

See also sections 8 and 13.

**SECTION 7: Handling and storage**

**7.1. Precautions for safe handling**

Precautions for safe handling

: Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. 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. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

**7.2. Conditions for safe storage, including any incompatibilities**

Storage conditions

: Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods.

**OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE:** When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

**7.3. Specific end use(s)**

None.



**SECTION 8: Exposure controls/personal protection**

**8.1. Control parameters**

<b>Nitric oxide (10102-43-9)</b>		
ACGIH	ACGIH TLV-TWA (ppm)	25 ppm
ACGIH	Biological Exposure Indices (BEI)	1.5 % of hemoglobin Parameter: Methemoglobin - Medium: blood - Sampling time: during or end of shift (background, nonspecific, semi-quantitative)
USA OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	30 mg/m <sup>3</sup>
USA OSHA	OSHA PEL (TWA) (ppm)	25 ppm
AU SWA TWA PPM	TWA (ppm)	25 ppm
AU SWA TWA MGM3	TWA (mg/m <sup>3</sup> )	31 mg/m <sup>3</sup>
AU SWA STEL MGM3	STEL (mg/m <sup>3</sup> )	31 mg/m <sup>3</sup>
<b>Nitrogen dioxide (10102-44-0)</b>		
ACGIH	ACGIH TLV-TWA (ppm)	0.2 ppm

Nitrogen dioxide (10102-44-0)		
USA OSHA	OSHA PEL (Ceiling) (mg/m <sup>3</sup> )	9 mg/m <sup>3</sup>
USA OSHA	OSHA PEL (Ceiling) (ppm)	5 ppm
AU SWA TWA PPM	TWA (ppm)	3 ppm
AU SWA TWA MGM3	TWA (mg/m <sup>3</sup> )	5.6 mg/m <sup>3</sup>
AU STEL PPM	STEL (ppm)	5 ppm
AU SWA STEL MGM3	STEL (mg/m <sup>3</sup> )	5.6 mg/m <sup>3</sup>
Nitrogen (7727-37-9)		
ACGIH	Not established	
USA OSHA	Not established	

### 8.2. Exposure controls

- Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Alarm detectors should be used when toxic gases may be released. Product to be handled in a closed system. Ensure exposure is below occupational exposure limits (where available).
- Personal protective equipment : Gloves. Safety glasses.
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- Eye protection : Wear safety glasses when handling cylinders; vapor-proof goggles and a face shield during cylinder changeout or whenever contact with product is possible. Select eye protection in accordance with AS/NZS 1336 and AS/NZS 1337.
- Skin and body protection : Wear work gloves and metatarsal shoes for cylinder handling. Protective equipment where needed. Select in accordance with AS/NZS 2161, AS/NZS 2210.1, and AS/NZS 4503.
- Respiratory protection : When workplace conditions warrant respirator use, follow a respiratory protection program that meets AS/NSZ 1715, AS/NSZ 1716, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).
- Thermal hazard protection : Wear cold insulating gloves when transfilling or breaking transfer connections.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

- Physical state : Gas
- Appearance : Colorless gas. Turns yellow to reddish brown on exposure to light and air.
- Color : Colorless red brown
- Odor : No data available
- Odor threshold : No data available
- pH : Not applicable.
- Relative evaporation rate (butyl acetate=1) : No data available
- Relative evaporation rate (ether=1) : Not applicable.
- Melting point : No data available
- Freezing point : No data available
- Boiling point : No data available
- Flash point : No data available
- Auto-ignition temperature : No data available

Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: Not applicable.
Relative vapor density at 20 °C	: No data available
Relative density	: No data available
Solubility	: Water: No data available
Log Pow	: Not applicable.
Log Kow	: Not applicable.
Viscosity, kinematic	: Not applicable.
Viscosity, dynamic	: Not applicable.
Explosive properties	: Not applicable.
Oxidizing properties	: None.
Explosion limits	: No data available

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

No additional information available

### 10.4. Conditions to avoid

No additional information available

### 10.5. Incompatible materials

No additional information available

### 10.6. Hazardous decomposition products

No additional information available

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity : Not classified

<b>Nitric oxide (10102-43-9)</b>	
LC50 inhalation rat (ppm)	57.5 ppm/4h
ATE US (gases)	57.5 ppmV/4h
<b>Nitrogen dioxide (10102-44-0)</b>	
LC50 inhalation rat (ppm)	57.5 ppm/4h
ATE US (gases)	57.5 ppmV/4h

Skin corrosion/irritation	: Not classified
	pH: Not applicable.
Serious eye damage/irritation	: Not classified
	pH: Not applicable.
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified

Specific target organ toxicity (single exposure) : Not classified  
 Specific target organ toxicity (repeated exposure) : Not classified  
 Aspiration hazard : Not classified

### SECTION 12: Ecological information

#### 12.1. Toxicity

Ecology - general : No known ecological damage caused by this product.

#### 12.2. Persistence and degradability

PTG-4143	
Persistence and degradability	No ecological damage caused by this product.
Nitric oxide (10102-43-9)	
Persistence and degradability	Not applicable for inorganic gases.
Nitrogen dioxide (10102-44-0)	
Persistence and degradability	Not applicable for inorganic gases.
Nitrogen (7727-37-9)	
Persistence and degradability	No ecological damage caused by this product.

#### 12.3. Bioaccumulative potential

PTG-4143	
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.
Nitric oxide (10102-43-9)	
Log Pow	Not applicable for inorganic gases.
Log Kow	Not applicable.
Bioaccumulative potential	No data available.
Nitrogen dioxide (10102-44-0)	
Log Pow	Not applicable for inorganic gases.
Bioaccumulative potential	No data available.
Nitrogen (7727-37-9)	
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

#### 12.4. Mobility in soil

PTG-4143	
Mobility in soil	No data available.
Nitric oxide (10102-43-9)	
Mobility in soil	No data available.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
Nitrogen dioxide (10102-44-0)	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
Nitrogen (7727-37-9)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.

#### 12.5. Other adverse effects

Effect on ozone layer : None.

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

- Waste treatment methods : Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at <http://www.eiga.org> for more guidance on suitable disposal methods.
- Product/Packaging disposal recommendations : Do not attempt to dispose of residual or unused quantities. Return container to supplier.

### SECTION 14: Transport information

#### Transport of Australian Dangerous Goods

- UN-No. (ADG) : UN1956
- Proper Shipping Name (ADG) : COMPRESSED GAS, N.O.S.
- Class (ADG) : 2.2 - 2.2 - Class 2.2 - Non-flammable compressed gas
- Danger labels (ADG) : 2.2 - Non-flammable compressed gas



- Special provision (ADG) : 274

#### In accordance with DOT

- Transport document description : UN1956 Compressed gas, n.o.s., 2.2
- UN-No.(DOT) : UN1956
- Proper Shipping Name (DOT) : Compressed gas, n.o.s.
- Class (DOT) : 2.2 - 2.2 - Class 2.2 - Non-flammable compressed gas
- Hazard labels (DOT) : 2.2 - Non-flammable gas



- DOT Symbols : G - Identifies proper shipping name (PSN) requiring the addition of technical name(s) in parentheses following the PSN.

#### Additional information

- Emergency Response Guide (ERG) Number : 126
- HazChem code : 2TE.
- Other information : No supplementary information available.
- Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers:  
 - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

#### Transport by sea

- UN-No. (IMDG) : 1956
- Proper Shipping Name (IMDG) : COMPRESSED GAS, N.O.S.
- Class (IMDG) : 2.2 - Non-flammable, non-toxic gases
- Limited quantities (IMDG) : 120ml
- EmS-No. (1) : F-C
- MFAG-No : 620



# PTG-4143

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EmS-No. (2) : S-V

### Air transport

UN-No. (IATA) : 1956  
Proper Shipping Name (IATA) : COMPRESSED GAS, N.O.S.  
Class (IATA) : 2  
Instruction "cargo" (ICAO) : 200  
Instruction "passenger" (ICAO) : 200  
Instruction "passenger" - Limited quantities (ICAO) : FORBIDDEN

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

#### Nitric oxide (10102-43-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory  
Listed on the United States SARA Section 302

SARA Section 302 Threshold Planning Quantity (TPQ)	100 lb
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#### Nitrogen dioxide (10102-44-0)

Listed on the United States TSCA (Toxic Substances Control Act) inventory  
Listed on the United States SARA Section 302

CERCLA RQ	10 lb releases to the air in amounts <1000 pounds per 24 hours which are the result of combustion and combustion-related activities are exempt from the notification requirements per 40 CFR 302.6
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SARA Section 302 Threshold Planning Quantity (TPQ)	100 lb
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### 15.2. International regulations

#### CANADA

#### Nitric oxide (10102-43-9)

Listed on the Canadian DSL (Domestic Substances List)

#### Nitrogen dioxide (10102-44-0)

Listed on the Canadian DSL (Domestic Substances List)

#### Nitrogen (7727-37-9)

Listed on the Canadian DSL (Domestic Substances List)

### EU-Regulations

#### Nitric oxide (10102-43-9)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

#### Nitrogen dioxide (10102-44-0)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

### 15.2.2. National regulations



### Nitric oxide (10102-43-9)

Listed on the AICS (Australian Inventory of Chemical Substances)  
 Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
 Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
 Listed on the Japanese ISHL (Industrial Safety and Health Law)  
 Listed on the Korean ECL (Existing Chemicals List)  
 Listed on NZIoC (New Zealand Inventory of Chemicals)  
 Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
 Listed on the Canadian IDL (Ingredient Disclosure List)  
 Listed on INSQ (Mexican National Inventory of Chemical Substances)  
 Listed on the TCSI (Taiwan Chemical Substance Inventory)

### Nitrogen dioxide (10102-44-0)

Listed on the AICS (Australian Inventory of Chemical Substances)  
 Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
 Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
 Listed on the Japanese ISHL (Industrial Safety and Health Law)  
 Listed on the Korean ECL (Existing Chemicals List)  
 Listed on NZIoC (New Zealand Inventory of Chemicals)  
 Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
 Listed on the Canadian IDL (Ingredient Disclosure List)  
 Listed on INSQ (Mexican National Inventory of Chemical Substances)  
 Listed on the TCSI (Taiwan Chemical Substance Inventory)

### 15.3. US State regulations

#### PTG-4143()

U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No

### Nitric oxide (10102-43-9)

U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL)
No	No	No	No	

### Nitrogen dioxide (10102-44-0)

U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL)
No	No	No	No	

### Nitrogen (7727-37-9)

U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL)
No	No	No	No	

### Nitric oxide (10102-43-9)

U.S. - Massachusetts - Right To Know List  
 U.S. - New Jersey - Right to Know Hazardous Substance List  
 U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List  
 U.S. - Pennsylvania - RTK (Right to Know) List



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### Nitrogen dioxide (10102-44-0)

U.S. - Massachusetts - Right To Know List  
U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List  
U.S. - Pennsylvania - RTK (Right to Know) List

### Nitrogen (7727-37-9)

U.S. - Massachusetts - Right To Know List  
U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - Pennsylvania - RTK (Right to Know) List

## SECTION 16: Other information

### Other information

: When you mix two or more chemicals, 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. Before using any plastics, confirm their compatibility with this product.

Praxair asks users of this product to study this SDS and become aware of the 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 SDS 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.

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 Safety Data Sheet. Since the use of this information and the conditions of use 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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