

### SECTION 1: Identification

#### 1.1. Product identifier

Product form	: Substance
Name	: Nitrous Oxide, Refrigerated Liquid
CAS No	: 10024-97-2
Formula	: N2O
Other means of identification	: Nitrous oxide, refrigerated liquid, Medipure® Nitrous Oxide
Product group	: Core Products

#### 1.2. Recommended use and restrictions on use

Recommended uses and restrictions	: Industrial use
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#### 1.3. Supplier

Praxair Canada inc.  
1200 – 1 City Centre Drive  
Mississauga - Canada L5B 1M2  
T 1-905-803-1600 - F 1-905-803-1682  
[www.praxair.ca](http://www.praxair.ca)

#### 1.4. Emergency telephone number

Emergency number	: 1-800-363-0042 Call emergency number 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.
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### SECTION 2: Hazard identification

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

##### GHS-CA classification

Simple asphyxiant	H380
Ox. Gas 1	H270
Liquefied gas	H280
Repr. 2	H361
STOT SE 3	H336

#### 2.2. GHS Label elements, including precautionary statements

##### GHS-CA labelling

Hazard pictograms	:    
	GHS03      GHS04      GHS07      GHS08

Signal word	: DANGER
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Hazard statements	: MAY CAUSE OR INTENSIFY FIRE; OXIDIZER CONTAINS REFRIGERATED GAS; MAY CAUSE CRYOGENIC BURNS OR INJURY MAY CAUSE DROWSINESS OR DIZZINESS MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION SUSPECTED OF DAMAGING FERTILITY OR THE UNBORN CHILD (Inhalation) MAY CAUSE FROSTBITE
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Precautionary statements	: Do not handle until all safety precautions have been read and understood Keep away from clothing and other combustible materials Keep valves and fittings free from oil and grease Avoid breathing gas
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according to the Hazardous Products Regulation (February 11, 2015)

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Use and store only outdoors or in a well-ventilated area  
Wear cold insulating gloves and either face shield or eye protection  
IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
In case of fire: Stop leak if safe to do so  
Use and store only outdoors or in a well-ventilated place  
Protect from sunlight when ambient temperature exceeds 52°C (125°F)  
Use a back flow preventive device in the piping  
Close valve after each use and when empty  
Use only with equipment of compatible materials of construction and rated for cylinder pressure  
Use only with equipment cleaned for oxygen service  
Avoid spills. Do not walk on or roll equipment over spills

### 2.3. Other hazards

Other hazards not contributing to the classification : Asphyxiant in high concentrations. Contact with liquid may cause cold burns/frostbite.

### 2.4. Unknown acute toxicity (GHS-CA)

No data available

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Name	CAS No.	% (Vol.)	Common Name (synonyms)
Nitrous Oxide, Refrigerated Liquid (Main constituent)	(CAS No) 10024-97-2	100	Dinitrogen oxide / Laughing gas / Nitrogen oxide (N <sub>2</sub> O) / NITROUS OXIDE

### 3.2. Mixtures

Not applicable

## 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.

First-aid measures after skin contact : The liquid may cause frostbite. For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). Water temperature should be tolerable to normal skin. Maintain skin warming for at least 15 minutes or until normal coloring and sensation have returned to the affected area. In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible.

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. Consult an eye specialist immediately.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

### 4.2. Most important symptoms and effects (acute and delayed)

No additional information available

### 4.3. Immediate medical attention and special treatment, if necessary

Other medical advice or treatment : None.

## SECTION 5: Fire-fighting measures

### 5.1. Suitable extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

### 5.2. Unsuitable extinguishing media

No additional information available

### 5.3. Specific hazards arising from the hazardous product

Fire hazard : Oxidizing agent; vigorously accelerates combustion. Contact with flammable materials may cause fire or explosion.

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- Explosion hazard : If venting or leaking gas catches fire, do not extinguish flames. Vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Contact with combustible materials such as oil, grease, and other hydrocarbon products, especially in the presence of ignition sources such as pilot lights, other flames, smoking, sparks, heaters, electrical equipment, and static discharges may cause fire or explosion. Explosive atmospheres may linger. Before entering an area, especially a confined area, check the atmosphere with an appropriate device.
- Reactivity : No reactivity hazard other than the effects described in sub-sections below.
- Reactivity in case of fire : No reactivity hazard other than the effects described in sub-sections below.

### 5.4. Special protective equipment and precautions for fire-fighters

- Firefighting instructions : DANGER! Extremely cold liquid and gas under pressure. Take care not to direct spray onto vents on top of container. Do not discharge sprays directly into liquid; cryogenic liquid can freeze water rapidly
- DANGER: High-pressure, oxidizing gas.** Evacuate personnel to a safe area. Appropriate self-contained breathing apparatus may be required. Remove all sources of ignition. Vapor can spread from spill. Contact with flammable materials may cause fire or explosion. When containers have cooled, move them away from fire area if safe to do so. Before entering the area, especially a confined area, check the atmosphere with an appropriate device. On-site fire brigades must comply with their provincial and local fire code regulations.
- Special protective equipment for fire fighters : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
- Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems
- Stop flow of product if safe to do so
- Use water spray or fog to knock down fire fumes if possible.
- Other information : Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by TC.)
- Oxidizing agent; vigorously accelerates combustion. Contact with flammable materials may cause fire or explosion
- Smoking, flames, and electric sparks are potential explosion hazards.

## SECTION 6: Accidental release measures

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

- General measures : **DANGER: High-pressure, oxidizing gas.** Evacuate personnel to a safe area. Appropriate self-contained breathing apparatus may be required. Approach suspected leak area with caution. Remove all sources of ignition. Vapor can spread from spill. Contact with flammable materials may cause fire or explosion. Ventilate area or move container to a well-ventilated area. Before entering the area, especially a confined area, check the atmosphere with an appropriate device.

### 6.2. Methods and materials for containment and cleaning up

- Methods for cleaning up : This material is an Asphyxiant Gas. Any leaks should be handled by Emergency Response personnel. For assistance call your supplier.

### 6.3. Reference to other sections

**For further information refer to section 8: Exposure controls/personal protection**

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### 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 only where temperature will not exceed 125°F (52°C). Post "No Smoking" or "Open Flames" signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g. NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16

**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.

Conditions to avoid : Do not store in a confined space. Cryogenic containers are each equipped with a pressure relief device and a pressure-controlling device. Under normal conditions, these containers will periodically vent product. Use adequate pressure relief devices in systems and piping to prevent pressure buildup; entrapped liquid can generate extremely high pressures when vaporized by warming.

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

Nitrous Oxide, Refrigerated Liquid (10024-97-2)		
USA - ACGIH	ACGIH TLV-TWA (ppm)	50 ppm
Canada (Quebec)	VEMP (mg/m <sup>3</sup> )	90 mg/m <sup>3</sup>
Canada (Quebec)	VEMP (ppm)	50 ppm
Alberta	OEL TWA (mg/m <sup>3</sup> )	90 mg/m <sup>3</sup>
Alberta	OEL TWA (ppm)	50 ppm
British Columbia	OEL TWA (ppm)	25 ppm
Manitoba	OEL TWA (ppm)	50 ppm
New Brunswick	OEL TWA (mg/m <sup>3</sup> )	90 mg/m <sup>3</sup>
New Brunswick	OEL TWA (ppm)	50 ppm
New Foundland & Labrador	OEL TWA (ppm)	50 ppm
Nova Scotia	OEL TWA (ppm)	50 ppm
Northwest Territories	OEL STEL (ppm)	75 ppm
Northwest Territories	OEL TWA (ppm)	50 ppm
Ontario	OEL TWA (mg/m <sup>3</sup> )	45 mg/m <sup>3</sup>

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Nitrous Oxide, Refrigerated Liquid (10024-97-2)		
Ontario	OEL TWA (ppm)	25 ppm
Prince Edward Island	OEL TWA (ppm)	50 ppm
Québec	VEMP (mg/m <sup>3</sup> )	90 mg/m <sup>3</sup>
Québec	VEMP (ppm)	50 ppm
Saskatchewan	OEL STEL (ppm)	75 ppm
Saskatchewan	OEL TWA (ppm)	50 ppm

### 8.2. Appropriate engineering controls

Appropriate engineering controls : Use a local exhaust system, if necessary, to prevent oxygen deficiency and to keep hazardous fumes and gases below all applicable limits in the worker's breathing zone. **MECHANICAL ENGINEERING CONTROLS:** Not recommended as a primary ventilation system to control worker's exposure. **USE ONLY IN A CLOSED SYSTEM.** An explosion-proof, corrosion-resistant, forced-draft fume hood is preferred.

### 8.3. Individual protection measures/Personal protective equipment

Personal protective equipment : Safety glasses. Face shield. Gloves.



Hand protection : Wear work gloves when handling containers. Wear heavy rubber gloves where contact with product may occur.

Eye protection : Wear goggles and a face shield when transfilling or breaking transfer connections. Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

Respiratory protection : **Respiratory protection:** Use respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select in accordance with provincial regulations, local bylaws or guidelines. Selection should be based on the current CSA standard Z94.4, "Selection, Care, and Use of Respirators." Respirators should also be approved by NIOSH and MSHA. 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.

Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

Other information : **Other protection :** Safety shoes for general handling at customer sites. Metatarsal shoes and cuffless trousers for cylinder handling at packaging and filling plants. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines. For working with flammable and oxidizing materials, consider the use of flame resistant anti-static safety clothing.

## SECTION 9: Physical and chemical properties

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

Physical state	: Gas
Appearance	: Colorless, non-flammable gas.
Molecular mass	: 44 g/mol
Colour	: Colourless.
Odour	: Sweetish.
Odour threshold	: Odour threshold is subjective and inadequate to warn of overexposure.
pH	: Not applicable.
pH solution	: No data available
Relative evaporation rate (butylacetate=1)	: No data available
Relative evaporation rate (ether=1)	: Not applicable.
Melting point	: -90.81 °C
Freezing point	: No data available
Boiling point	: -88.5 °C



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Flash point	: Not applicable.
Critical temperature	: 36.4 °C
Auto-ignition temperature	: Not applicable.
Decomposition temperature	: 650 °C
Vapour pressure	: 5080 kPa
Vapour pressure at 50 °C	: No data available
Critical pressure	: 7255 kPa
Relative vapour density at 20 °C	: No data available
Relative density	: 1.2
Relative density of saturated gas/air mixture	: No data available
Density	: 0.785 g/cm <sup>3</sup> (at 20 °C)
Relative gas density	: 1.5
Solubility	: Water: 2.2 mg/l
Log Pow	: Not applicable.
Log Kow	: Not applicable.
Viscosity, kinematic	: Not applicable.
Viscosity, dynamic	: Not applicable.
Viscosity, kinematic (calculated value) (40 °C)	: No data available
Explosive properties	: Not applicable.
Oxidizing properties	: Oxidizer.
Flammability (solid, gas)	: Non flammable

### 9.2. Other information

Gas group	: Liquefied gas
Additional information	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Reactivity	: No reactivity hazard other than the effects described in sub-sections below.
Chemical stability	: Stable under normal conditions. In the presence of catalysts (e.g. halogen products, mercury, nickel, platinum) the rate of decomposition increases and decomposition can occur at even lower temperatures. At temperatures over 575°C and at atmospheric pressure, nitrous oxide decomposes into nitrogen and oxygen. Pressurized nitrous oxide can also decompose at temperatures equal or greater than 300°C. Nitrous oxide dissociation is irreversible and exothermic, leading to a considerable rise in pressure.
Possibility of hazardous reactions	: Violently oxidizes organic material.
Conditions to avoid	: Heat.
Incompatible materials	: Flammable materials, Hydrocarbons, Avoid oil, grease and all other combustible materials, Asphalt, Ethers, Alcohols, Acids, and Aldehydes. Alkali metals, Boron (B), tungsten carbide, and powdered aluminium.
Hazardous decomposition products	: Nitrous oxide decomposes explosively at 1202°F (650°C) into two parts Nitrogen and one part oxygen. In the presence of catalytic surfaces such as Silver, Platinum (Pt), Cobalt (Co), and Copper or nickel oxide, this reaction occurs at lower temperatures.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Not classified

#### Nitrous Oxide, Refrigerated Liquid (NF) 10024-97-2

LC50 inhalation rat (ppm)	> 250 ppm/4h
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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	: SUSPECTED OF DAMAGING FERTILITY OR THE UNBORN CHILD (Inhalation).
Specific target organ toxicity (single exposure)	: MAY CAUSE DROWSINESS OR DIZZINESS.
Specific target organ toxicity (repeated exposure)	: Not classified
Aspiration hazard	: Not classified

### SECTION 12: Ecological information

#### 12.1. Toxicity

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

#### 12.2. Persistence and degradability

##### Nitrous Oxide, Refrigerated Liquid (10024-97-2)

Persistence and degradability	Not applicable for inorganic gases.
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#### 12.3. Bioaccumulative potential

##### Nitrous Oxide, Refrigerated Liquid (10024-97-2)

Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No data available.

#### 12.4. Mobility in soil

##### Nitrous Oxide, Refrigerated Liquid (10024-97-2)

Mobility in soil	No data available.
Log Pow	Not applicable.
Log Kow	Not applicable.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

#### 12.5. Other adverse effects

Effect on the ozone layer	: None
Global warming potential [CO <sub>2</sub> =1]	: 298
Effect on global warming	: When discharged in large quantities may contribute to the greenhouse effect

### SECTION 13: Disposal considerations

#### 13.1. Disposal methods

Waste treatment methods	: Do not discharge into any place where its accumulation could be dangerous. Contact supplier if guidance is required.
Waste disposal recommendations	: Do not attempt to dispose of residual or unused quantities. Return container to supplier.

### SECTION 14: Transport information

#### 14.1. Basic shipping description

In accordance with TDG

#### TDG

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UN-No. (TDG) : UN2201  
TDG Primary Hazard Classes : 2.2 - Class 2.2 - Non-Flammable, Non-Toxic Gas.  
TDG Subsidiary Classes : 5.1  
Proper shipping name : NITROUS OXIDE, REFRIGERATED LIQUID

ERAP Index : 3 000  
Explosive Limit and Limited Quantity Index : 0  
Passenger Carrying Ship Index : Forbidden  
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : Forbidden

### 14.3. Air and sea transport

#### IMDG

UN-No. (IMDG) : 2201  
Class (IMDG) : 2 - Gases  
MFAG-No : 122

#### IATA

UN-No. (IATA) : 2201  
Class (IATA) : 2

## SECTION 15: Regulatory information

### 15.1. National regulations

#### Nitrous Oxide, Refrigerated Liquid (10024-97-2)

Listed on the Canadian DSL (Domestic Substances List)

### 15.2. International regulations

#### Nitrous Oxide, Refrigerated Liquid (10024-97-2)

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 EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
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 United States TSCA (Toxic Substances Control Act) inventory  
Listed on INSQ (Mexican national Inventory of Chemical Substances)

## SECTION 16: Other information

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Indication of changes:

Training advice : The hazard of asphyxiation is often overlooked and must be stressed during operator training.

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### 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 Canada 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 Canada Inc, it is the user's obligation to determine the conditions of safe use of the product. Praxair Canada Inc, SDSs are furnished on sale or delivery by Praxair Canada Inc, or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Praxair sales representative, local distributor, or supplier, or download from [www.praxair.ca](http://www.praxair.ca). If you have questions regarding Praxair SDSs, would like the document number and date of the latest SDS, or would like the names of the Praxair suppliers in your area, phone or write Praxair Canada Inc, (Phone: 1-888-257-5149; Address: Praxair Canada Inc, 1 City Centre Drive, Suite 1200, Mississauga, Ontario, L5B 1M2).

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### NFPA health hazard

: 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

### NFPA fire hazard

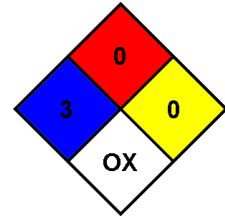
: 0 - Materials that will not burn.

### NFPA reactivity

: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.

### NFPA specific hazard

: OX - This denotes an oxidizer, a chemical which can greatly increase the rate of combustion/fire.



### HMIS III Rating

#### Health

: 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

#### Flammability

: 0 Minimal Hazard - Materials that will not burn

#### Physical

: 2 Moderate Hazard - Materials that are unstable and may undergo violent chemical changes at normal temperature and pressure with low risk for explosion. Materials may react violently with water or form peroxides upon exposure to air.

### SDS Canada (GHS) - Praxair

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*

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