

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Air, (Cryogenic Liquid)	Trade Name: Air, (Cryogenic Liquid)
Product Use: Many.	
Chemical Name: Air	Synonym: Synthetic air, reconstituted air
Chemical Formula: Mixture of N ₂ and O ₂	Chemical Family: Not applicable.
Telephone: Emergencies: * 1-800-363-0042	Supplier /Manufacture: Praxair Canada Inc. 1 City Centre Drive Suite 1200 Mississauga, ON L5B 1M2
	Phone: 905-803-1600
	Fax: 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 ₅₀ (Species & Routes)	LC ₅₀ (Rat, 4 hrs.)	TLV-TWA (ACGIH)
Air	100	132259-10-0	Not applicable.	Not applicable.	None established.

3. Hazards Identification

Emergency Overview

CAUTION! Extremely cold liquid and gas under pressure. Can cause severe frostbite.

ROUTES OF EXPOSURE: Swallowing. Skin contact.

THRESHOLD LIMIT VALUE: TLV-TWA Data from 2004 Guide to Occupational Exposure Values (ACGIH). 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: No harm expected.

SKIN CONTACT: No harm expected from vapour. Liquid may cause frostbite.

SKIN ABSORPTION: No harm expected.

SWALLOWING: An unlikely route of exposure, but frostbite of the lips and mouth may result from contact with the liquid.

EYE CONTACT: No harm expected from vapour. Liquid may cause frostbite.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE:

None currently known.

OTHER EFFECTS OF OVEREXPOSURE:

None known.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:

Repeated or prolonged exposure is not known to aggravate medical condition.

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

None expected.

CARCINOGENICITY:

Not listed as carcinogen by OSHA, NTP or IARC.

4. First Aid Measures

INHALATION:

None expected.

SKIN CONTACT:

Immediately warm frostbite area with warm water (not to exceed 40 C). In case of massive exposure, remove clothing and shoes while showering with warm water. Get medical attention immediately.

SWALLOWING:

This product is a gas at normal temperature and pressure.

EYE CONTACT:

For contact with the liquid, immediately flush eyes thoroughly with warm water for at least 15 minutes. 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. This product is similar to the air we breathe. 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:

Oxidizing agent. May accelerate combustion. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

CAUTION! 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 leak if without risk. Do not discharge water sprays into liquid air.

UNUSUAL FIRE AND EXPLOSION HAZARD:

Oxidizing agent, may accelerate combustion. Contact with flammable materials may cause fire or explosion. Container may rupture due to heat of fire. Liquid air will freeze water rapidly. Containers are provided with a pressure relief device designed to vent contents when they are exposed to elevated temperature. Do not walk on or roll equipment over spill as this could cause explosion. Liquid causes severe frostbite. Smoking, flames and electric sparks in the presence of enriched oxygen atmospheres are potential explosion hazards. Air is continuously vented from pressure-control valves on container.

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! Extremely cold oxidizing liquid and gas. Allow spilled liquid to evaporate. Do not walk on or roll equipment over spill as this could cause explosion. Contact with flammable materials may cause fire or explosion. Shut off leak if without risk. Ventilate area of leak or move leaking container to ventilated area.

WASTE DISPOSAL METHOD:

Keep personnel away. Liquid air should be dumped into an outdoor pit filled with clean, grease-free and oil-free gravel, where it will safely evaporate. 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:

Extremely cold oxidizing liquid and gas. Do not get liquid or vapours in eyes, on skin, or clothing. Safety showers and eyewash fountains should be immediately available. Use only in a closed system. Use piping and equipment adequately designed to withstand pressures to be encountered. . Liquid can solidify air. **Vigorously accelerates combustion.** Keep oil, grease, and combustibles away. **Store and use with adequate ventilation at all times.** Close valve after each use; keep closed even when empty. Air will condense on exposed liquid or cold-gas surfaces, such as vaporizers and piping. Nitrogen, having a lower boiling point than oxygen, will evaporate first leaving an oxygen-enriched condensation on the surface. **Prevent reverse flow.** Reverse flow into cylinder may cause rupture. **When returning cylinder to supplier,** be sure valve is closed. **Never work on a 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: No special containment is required.

MECHANICAL (general): No special containment is required.

SPECIAL: None.

OTHER: None.

PERSONAL PROTECTION:

RESPIRATORY PROTECTION: None required.

SKIN PROTECTION: Loose-fitting cryogenic gloves.

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

PHYSICAL STATE: Liquid.	FREEZING POINT: -216.2°C (-357.2°F)	pH: Not applicable.
BOILING POINT: -194.3°C (-317.7°F)	VAPOUR PRESSURE: Not applicable.	MOLECULAR WEIGHT: 28.975 g/mole
SPECIFIC GRAVITY: LIQUID (Water = 1) 0.874 @ -194.3 C	SOLUBILITY IN WATER: Negligible.	
SPECIFIC GRAVITY: VAPOUR (air = 1) 1.00	EVAPORATION RATE (Butyl Acetate=1): High.	COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable.
VAPOUR DENSITY: 0.0012 g/ml	% VOLATILES BY VOLUME: 100% (v/v).	ODOUR THRESHOLD: Odourless.
APPEARANCE & ODOUR: Colourless. Odourless gas		

10. Stability and Reactivity

STABILITY:	The product is stable.
CONDITIONS OF CHEMICAL INSTABILITY:	Elevated temperatures.
INCOMPATIBILITY (materials to avoid):	Flammable and combustible material, asphalt, oils and greases, activated charcoal, diethyl ether.
HAZARDOUS DECOMPOSITION PRODUCTS:	None.
HAZARDOUS POLYMERIZATION:	Will not occur.
CONDITIONS OF REACTIVITY:	None 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:

Air, Refrigerated Liquid

HAZARD CLASS:

C L A S S 2 . 2 :
Non-flammable,
non-corrosive and
non-poisonous gas.

IDENTIFICATION #:

UN1003

PRODUCT RQ:

100 L

SHIPPING LABEL(s):

Non-flammable, non-poisonous gas

PLACARD (when required):

Non-flammable, non-poisonous 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 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.

WHMIS (Canada)

CLASS A: Compressed gas.

International Regulations

EINECS

Not available.

DSCL (EEC)

This product is not classified according to the EU regulations.

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 0

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:**THREADED:** Not applicable.**PIN-INDEXED YOKE:** Not applicable.**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.

- AV-1 Safe Handling and Storage of Compressed Gas
- G-7.1 Commodity Specification for Air
- P-1 Safe Handling of Compressed Gases in Containers
- P-12 Safe Handling of Cryogenic Liquids
- 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, Fourth Edition

PREPARATION INFORMATION:**DATE:** 10/15/2004**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 information, (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.

Praxair and the *Flowing Airstream* design are trademarks of
Praxair Canada Inc.

Other trademarks used herein are trademarks or registered trademarks of their respective owners.

Product Name: Air, (Cryogenic Liquid)

MSDS# E-4878-F

Date: 10/15/2004



Praxair Canada Inc.
1 City Centre Drive
Suite 1200
Mississauga, ON L5B 1M2

Copyright © 2004, Praxair Canada Inc.

Page 7 of 7