

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

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|--|---|
| Product Name: Oxygen/Inert Gas Oxidizing Mixture | Trade Name: Heliox |
| Product Use: Many. | |
| Chemical Name: Oxygen/Inert Gas Oxidizing Mixture | Synonym: Not applicable. |
| Chemical Formula: Not applicable. | Chemical Family: Not applicable. |
| Telephone: | Supplier /Manufacture: Praxair Canada Inc. 1 City Centre Drive Suite 1200 Mississauga, ON L5B 1M2 |
| Emergencies: * 1-800-363-0042 | 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. Hazards Identification

Emergency Overview

WARNING! High-pressure, oxidizing gas. Vigorously accelerates combustion. Self-contained breathing apparatus may be required by rescue workers.

ROUTES OF EXPOSURE: Inhalation.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION: Breathing 80% or more oxygen at atmospheric pressure for more than a few hours may cause nasal stuffiness, cough, sore throat, chest pain and breathing difficulty. Breathing oxygen at higher pressure increases the likelihood of adverse effects within a shorter time period. Breathing pure oxygen under pressure may cause lung damage and also central nervous system effects resulting in dizziness, poor co-ordination, tingling sensation, visual and hearing disturbances, muscular twitching, unconsciousness and convulsions. Breathing oxygen under pressure may cause prolongation of adaptation to darkness and reduce peripheral vision. This gas mixture can also be an asphyxiant at high concentrations.

SKIN CONTACT: No evidence of adverse effects from available information.

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

SWALLOWING: No evidence of adverse effects from available information.

EYE CONTACT: No evidence of adverse effects from available information.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE:

No evidence of adverse effects from available information.

OTHER EFFECTS OF OVEREXPOSURE:

See "Notes to Physician" in the "First Aid" Section.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:

See "Notes to Physician" in the "First Aid" Section.

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

None currently known.

CARCINOGENICITY:

Not listed as carcinogen by OSHA, NTP or IARC.

3. Composition and Information on Ingredients

| COMPONENTS | CAS NUMBER | CONCENTRATION % by Mole |
|--|-------------------|--------------------------------|
| Oxygen | 7782-44-7 | 23.5-99.999 |
| And contains one or more of the following gases: | | |
| Argon | 7440-37-1 | 0-76.5 |
| Helium | 7440-59-7 | 0-76.5 |
| Krypton | 7439-90-9 | 0-76.5 |
| Neon | 7440-01-9 | 0-76.5 |
| Nitrogen | 7727-37-9 | 0-76.5 |
| Xenon | 7440-63-3 | 0-76.5 |

4. First Aid Measures

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:

No emergency care anticipated.

SWALLOWING:

This product is a gas at normal temperature and pressure.

EYE CONTACT:

No emergency care anticipated.

NOTES TO PHYSICIAN:

Supportive treatment should include immediate sedation, anti-convulsive therapy if needed, and rest. Animal studies suggest that the administration of certain drugs, including phenothiazine drugs and chloroquine, increases the susceptibility to toxicity from oxygen at high concentrations or pressures. Animal studies also indicate that vitamin E deficiency may increase susceptibility to oxygen toxicity. Airway obstruction during high oxygen tension may cause alveolar collapse following absorption of the oxygen. Similarly, occlusion of the eustachian tubes may cause retraction of the eardrum, and obstruction of the paranasal sinuses may product "vacuum-type" headache. Newborn premature infants exposed to high oxygen concentration s may suffer delayed retinal damage which can progress to retinal detachment and blindness (retrolental fibroplasia). Retinal damage can also occur in adults exposed to 100% oxygen under greater than atmospheric pressure, particularly in individuals whose retinal circulation has been previously compromised.

All individuals exposed for long periods to oxygen at high pressure and all who exhibit overt oxygen toxicity should have ophthalmologic examinations.

5. Fire Fighting Measures

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

EXTINGUISHING MEDIA:

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

PRODUCTS OF COMBUSTION:

None.

PROTECTION OF FIREFIGHTERS:

WARNING! Evacuate all personnel to a safe distance. Immediately deluge containers with water spray from maximum distance until cool, then move containers away from fire area if without risk.

SPECIFIC PHYSICAL AND CHEMICAL HAZARDS:

Oxidizing agent, may accelerate combustion. Contact with flammable materials may cause fire or explosion. Container may rupture due to heat of fire. Vapours are extremely irritating. Contact may cause burns to skin and eyes. No part of a container should be subjected to a temperature higher than 52 C. See incompatibility in Section X. Most containers are provided with a pressure relief device designed to vent contents when they are exposed to elevated temperature.

SENSITIVITY TO IMPACT:

Avoid impact against container.

SENSITIVITY TO STATIC DISCHARGE:

Not applicable.

PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIREFIGHTERS:

Firefighters should wear self-contained breathing apparatus and full fire-fighting turnout gear.

FLAMMABLE LIMITS IN AIR, % by volume:

LOWER: Not applicable. **UPPER:** Not applicable.

FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Personal Precautions:

WARNING! Shut off leak if without risk. Ventilate area of leak or move leaking container to well-ventilated area. Remove all flammable materials from vicinity. Gas mixture must never be permitted to strike an oily surface, greasy clothes, or other combustible material.

Environmental Precautions:

Slowly release into atmosphere outdoors. Discard any product, residue, disposal container or liner in an environmentally acceptable manner, in full compliance with Federal, Provincial and local regulations.

7. Handling and Storage

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. Electrical equipment must be non-sparking or explosion-proof. Leak check system with soapy water; never use a flame. 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.

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. For full details and requirements, see NFPA 50A, "Standard for Gaseous Hydrogen at Consumer Sites", published by the National Fire Protection Association.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE:

HIGH-PRESSURE, OXIDIZING GAS. Use piping and equipment adequately designed to withstand pressures to be encountered. **Vigorously accelerates combustion.** Keep oil, grease, and combustibles away. **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 an environmentally safe manner in compliance with all federal, provincial, and local laws, then repair the leak. **Never allow a compressed gas cylinder to become part of an electrical circuit.** Electric arcs weaken cylinder metal and can cause catastrophic failure.

RECOMMENDED PUBLICATIONS:

Additional information on storage, handling, and use of this product is provided in **NFPA 55: *Standard for the Storage, Use, and Handling of Compressed and Liquefied Gases in Portable Cylinders***, published by the National Fire Protection Association.

See also Praxair publication P-14-153, *Guidelines for Handling Gas Cylinders and Containers*. Obtain from your local supplier.

8. Exposure Controls/Personal Protection

| INGREDIENTS | CAS NUMBER | LD ₅₀ (Species & Routes) | LC ₅₀ (Rat, 4 hrs.) | Exposure Limits |
|--|------------|--|-----------------------------------|--------------------|
| Oxygen | 7782-44-7 | Not available. | Not available. | Not available. |
| And contains one or more of the following gases: | | | | |
| Argon | 7440-37-1 | Not available. | Not available. | Simple asphyxiant. |
| Helium | 7440-59-7 | Not available. | Not available. | Simple asphyxiant. |
| Krypton | 7439-90-9 | Not available. | Not available. | Simple asphyxiant. |
| Neon | 7440-01-9 | Not available. | Not available. | Simple asphyxiant. |

Product Name: Oxygen/Inert Gas Oxidizing Mixture

MSDS# E-6772-I

Date: Oct. 15, 2016

| | | | | |
|----------|-----------|------------------------------|------------------------------|--------------------|
| Nitrogen | 7727-37-9 | available. Not available. | available. Not available. | Simple asphyxiant. |
| Xenon | 7440-63-3 | available. Not available. | available. Not available. | Simple asphyxiant. |

IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH):

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST: Not applicable.

MECHANICAL (General): Acceptable.

SPECIAL: Not applicable.

OTHER: Not applicable.

PERSONAL 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 the provincial regulations or guidelines. Selection should also be based on the current CSA standards Z94.4, "Selection, care and use of respirators". Respirators should be approved by NIOSH and MSHA.

SKIN PROTECTION: Preferred for cylinder handling.

EYE PROTECTION: 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: Gas. | FREEZING POINT: Not available. | pH: Not available. |
| BOILING POINT: Not available. | VAPOUR PRESSURE: Not available. | MOLECULAR WEIGHT: Not available. |
| SPECIFIC GRAVITY: Not available. LIQUID (Water = 1) | SOLUBILITY IN WATER: Not available. | |
| SPECIFIC GRAVITY: Not available. VAPOUR (air = 1) | EVAPORATION RATE: Not available. (Butyl Acetate=1): | COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available. |
| VAPOUR DENSITY: Not available. | % VOLATILES BY VOLUME: Not available. | ODOUR THRESHOLD: Not available. |

APPEARANCE & ODOUR: Colourless. Odourless gas at normal temperature and pressure.

10. Stability and Reactivity

| | |
|--|---|
| STABILITY: | The product is stable. |
| CONDITIONS OF CHEMICAL INSTABILITY: | See Section 7. |
| INCOMPATIBILITY (materials to avoid): | Combustible materials, asphalt, flammable materials, especially oils and greases. |
| HAZARDOUS DECOMPOSITION PRODUCTS: | None. |
| HAZARDOUS POLYMERIZATION: | Will not occur. |
| CONDITIONS TO AVOID: | None currently known. |
| CONDITIONS OF REACTIVITY: | None currently known. |

11. Toxicological Information

ACUTE DOSE EFFECTS: See section 2.

STUDY RESULTS:

None known.

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: Slowly release into atmosphere outdoors. Discard any product, residue, disposal container or liner in an environmentally acceptable manner, in full compliance with Federal, Provincial and local regulations.

14. Transport Information

TDG/IMO SHIPPING NAME: Compressed gas, oxidizing, n.o.s. (Oxygen)

| | | |
|---|----------------------------------|---|
| HAZARD CLASS: CLASS 2.2(5.1): Non-flammable, non-corrosive non-toxic, oxidizing gas. | IDENTIFICATION #: UN 3156 | PRODUCT REPORTABLE QUANTITY (PRQ): Any accidental release in a quantity that could pose a danger to public safety or any sustained release of 10 minutes or more. |
|---|----------------------------------|---|

SHIPPING LABEL(s): Special/Oxidizer with Class 2 at bottom.

PLACARD (When Required): Special/Oxidizer with Class 2 at bottom.

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. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS (Canada): CLASS A: Compressed gas.
CLASS C: Oxidizing material.
This product is on the DSL list.

International Regulations:

EINECS: Not available.
DSCL (EEC): R8- Contact with combustible material may cause fire.

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-296
PIN-INDEXED YOKE: Not applicable.
ULTRA-HIGH-INTEGRITY CONNECTION: Not applicable.

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
P-1 Safe Handling of Compressed Gases in Containers
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

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.

For more in-depth 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, 2018
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.

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