MSDS Oxygen, Compressed

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Emergency Phone: (800) 424-9300
Union Industrial Gas: 972-893-5600
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Product Name: Oxygen, Compressed
Chemical Name: Oxygen
Formula: 02
Chemical Family: Oxidizer
Use: Welding Gas, Medical
Synonyms: Oxygen USP, Aviators Breathing Oxygen (ABO)

NFPA Fire: 0
NFPA Health: 0
NFPA Reactivity: 0
NFPA Special Hazard: OX

HMIS Fire: 0
HMIS Health: 0
HMIS Reactivity: 0
Mixture: No

Acute: No
Chronic: No
Fire: Yes
Reactive: No
Sudden Release Pressure: Yes

02. INGREDIENTS - COMPOSITION & INFORMATION

COMPONENT	CAS No.	PERCENT (BY WT.)		EXPOSURE GUIDELINES	
				OSHA - TWA	ACGIH – STEL
Oxygen	7782-44-7	99.0%	100.0%	None.	N/A
LD5O: None. LC5O: None.					

03. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

Warning: Odorless, colorless high pressure oxidizing gas. Vigorously accelerates combustion.

Potential Health Effects Information:

Routes of Exposure:

Inhalation: Breathing 80% or more oxygen at atmospheric pressure for more that 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 coordination, tingling sensation, visual and hearing disturbances, muscular twitching, unconsciousness and convulsion. Breathing oxygen under pressure may cause prolongation of adaptation to darkness and reduced peripheral vision.

Eye: None.

Skin: None.

Chronic Effects: None

Medical Conditions Aggravated By:

Patients with chronic obstructive pulmonary disease retain carbon dioxide abnormally. If oxygen is **Overexposure:** administered to them, raising the oxygen concentration in the blood depresses their breathing and raises their retained carbon dioxide to a dangerous level.

Other Effects Of Overexposure See Section 11 'Toxicological Information".

Carcinogenicity: Oxygen is not listed by NTP, OSHA, or IARC

04. FIRST AID MEASURES

Inhalation: Move victim to fresh air or if in elevated pressures reduce oxygen pressures to I atmosphere. Call a physician. The physician should be advised that the victim has been exposed to a high concentration of oxygen.

Rescue personnel should be aware of the extreme fire hazards associated with oxygen-enriched atmospheres.

Skin: None.
Ingestion: None.
Eye: None.

Note To Physician: Supportive treatment should include immediate sedation, anti-convulsive therapy if needed, and rest. More detailed information can be found in Section 11 "Toxicological Information"

05. FIRE FIGHTING MEASURES

Flash Point: Not applicable; Gas.
Autoignition: Not applicable.

Flammable Limits - Lower: Not applicable.
Flammable Limits - Upper: Not applicable.
Extinguishing Media: Oxygen is nonflammable and will accelerate combustion. Use extinguishing media appropriate for surrounding fire.
Fire Fighting Instructions: Evacuate all personnel from the danger area. If possible, shut off flow of oxygen which is supporting the fire. Immediately cool containers with water spray from maximum distance. Do not direct water spray at the container vent. When cool, move containers from fire area, if without risk.

Fire And Explosion Hazards: Oxidizing agent, vigorously accelerates combustion. Some materials which are noncombustible in air will bum in the presence of an oxygen-enriched atmosphere (over 23%). Oxygen may form explosive compounds when exposed to combustible materials or oil, grease, and other hydrocarbon materials.

Upon exposure to intense heat or flame, cylinder will vent rapidly and or rupture violently. Most cylinders are designed to vent contents when exposed to elevated temperatures.

Pressure in a container can build up due to heat and it may rupture if pressure relief devices should fail to function.

Hazardous Combustion Products: None known.
Sensitivity To Static Discharge: Not applicable.
Sensitivity To Mechanical Impact: None.

06. ACCIDENTAL RELEASE MEASURES

Evacuate: Evacuate all personnel from the affected area. Shut off source of Oxygen, if possible without risk. Ventilate area or remove leaking containers to a well-ventilated location. Remove sources of heat,Ignition and, if possible, separate combustibles from the leak. If leaking from cylinder or its valve, contact your supplier.

07. HANDLING AND STORAGE

Storage: Store and use with adequate ventilation. Cylinders should be separated from flammables by a minimum distance of 20 ft. or by a barrier of non-combustible material at least 5 ft high having a fire resistance rating of a least 1/2 hour.

Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling or being knocked over. Post "No Smoking or Open Flames" signs in the storage area. Protect cylinders from physical damage; do not drag, roll, slide or drop. Do not allow storage area temperature to exceed 125° F *(52°* C). Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time.

Handling: Use a suitable hand truck for cylinder movement. Never attempt to lift a cylinder by its valve protection cap. Keep cylinders and their valves free from oil and grease. Open valve slowly. If user experiences difficulty operating cylinder valve, discontinue use and contact supplier. Never insert an object (e.g., wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit. Use an adjustable strap wrench to remove over-tight or rusted caps.
For additional precautions in using oxygen see Section 16 - Other Information.

When used in welding and cutting: Read and understand the manufacturer's instructions and the precautionary label on the products. Se American National Standards Institute (ANSI) Z49. 1 Safety in Welding and Cutting published by the American Welding Society, P.O. Box 351040, Miami, Florida 33135 and National Fire Protection Association)NFPA) 51 Oxygen Fuel Gas Welding and Cutting.

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08. EXPOSURE CONTROLS - PERSONAL PROTECTION

Engineering Controls:

Ventilation: Natural or mechanical to prevent oxygen-enriched atmospheres over 23% oxygen.

Personal Protective Equipment (PPE):

Skin Protection:

Clothing: Cotton clothing is recommended for use to prevent static buildup. Long sleeve shirts and trousers without cuffs.

Glasses: Safety glasses are recommended when handling cylinders.

Shoes: Safety shoes are recommended when handling cylinders.

Gloves: Work gloves are recommended when handling cylinders. If used, gloves must be c lean and free of oil and grease.

Respiratory Protection: Before entering area you must check for flammable and oxygen deficient atmospheres. Respirator: None required in general use.

Emergency Use: Not Required.

09. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Gas
Color:	Colorless
Odor:	Odorless
Molecular Weight:	32.00
Boiling Point:	-297.3°F (-183.0°C) @ 1 atm
Specific Gravity:	1.1 At70°F(21.1°C) @1 atm, Air=l
Freezing/Melting Point:	-361.8°F (-2 18.8°C), @ 1 atm
Vapor Pressure:	Not Applicable
Vapor Density:	.083 lb./cu ft (1.326 kg/CuM), At 32°F (0°C) @ 1 atm
Water Solubility:	.0491 Vol./Vol. At 70° F (21.1°C) @ 1 atm
Expansion Ratio:	Not Applicable - Gas
pH:	Not Applicable - Gas
Odor Threshold:	Not Applicable - Gas
Evaporation Rate:	Not Applicable - Gas
Coefficient Of Water/Oil Distribution:	Information not available

10. STABILITY AND REACTIVITY

Chemical Stability:	Stable
Conditions To Avoid:	None.
Incompatibility With Other Materials:	Flammable materials, hydrocarbons such as oils and grease, asphalt, ethers, alcohols, acids and aldehydes.
Hazardous Decomposition Products:	None
Hazardous Polymerization:	Will not occur

11. TOXICOLOGICAL INFORMATION

Other Studies Relevant To Material:	At atmospheric concentration and pressure, oxygen poses no toxicity hazards. Premature infants exposed to high oxygen concentrations may suffer delayed retinal damage which can progress to retinal detachment and blindness. Retinal damage may also occur in adults exposed to 100% oxygen for extended periods (24 to 48 lir). At two or more atmosphere central nervous system (CNS) toxicity occurs. Symptoms include nausea, vomiting, dizziness or vertigo, muscle twitching, vision changes, and loss of consciousness and generalized seizures. At three atmospheres, CNS toxicity occurs in less than two hours, and at six atmospheres in only a few minutes.
Additional Notes to Physician:	Animal studies suggest that the administration of certain drugs, including phenothiazine drugs and chioroquine, increase the susceptibility to toxicity from oxygen at high 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 produce "vacuum-type" headache. All individuals exposed for long periods to oxygen at high pressure and who exhibit overt oxygen toxicity should have ophthalmologic examinations.
Irritancy Of Material:	None.
Reproductive Effects:	None.
Teratogenicity:	None.
Synergistic Materials:	None.
Sensitization To Material:	None.
Mutagenicity:	None.

12. ECOLOGICAL INFORMATION

Ecotoxicity:	The atmosphere contains approximately 21% oxygen. No adverse ecological effects are expected. Oxygen does not contain any Class I or Class II ozone depleting chemicals (40 CFR Part 82).Oxygen is not listed as a marine pollutant by DOT (49 CFR Part 171).

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:	Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier. Unserviceable cylinders should be returned to the supplier for safe and proper disposal. For emergency disposal, discharge slowly to the atmosphere in a well-ventilated area or outdoors.

14. TRANSPORT INFORMATION

DOT/IMO Shipping Name:	Oxygen, Compressed
Hazard Class:	2.2 (Nonflammable gas.)
Identification Number:	UN 1072

PIN:	1072
Product RQ:	None

Shipping Label:	Oxygen label for Domestic shipment in the U.S. and Canada in place of the nonflammable and oxidizer labels (49 CFR Part 172)
Special Shipping Information:	Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious hazards and should be discouraged.
Placard (When Required):	Nonflammable Gas or oxygen.

15. REGULATORY INFORMATION

REGULATORY REQUIREMENTS:

The following information concerns selected regulatory requirements potentially applicable to this product. Not all such requirements are identified. Users of this product are responsible for their own regulatory compliance on a federal, state, and local level.

U.S. FEDERAL REGULATIONS:

EPA - Environmental Protection Agency:

CERCLA:	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (40 CFR Parts 117 and 302):
Reportable Quantity:	None.
SARA:	Superfund Amendment and Reauthorization Act.
Sections 302/304:	Requires emergency planning on threshold quantities (TPQ) and release reporting based on reportable quantities (RQ) of EPA's extre mely hazardous substances (40 CFR Part 355).
Extremely Hazardous Substances:	None.
Threshold Planning Quantity (TPQ):	None.
Sections 311/312:	Require submission of material safety data sheets (MSDSs) and chemical inventory reporting with identification of EPA defined hazard classes (40 CFR Part 370). The hazard classes for this product (Immediate, Delayed, Pressure, Reactivity, Fire) are shown in Section 1 above.
Section 313:	Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372. Oxygen does not require reporting under Section 313.
40 CFR Part 68:	Risk management for Chemical Accidental Release. Requires the development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds. Oxygen is not listed as a regulated substance.
TSCA:	Toxic Substance Control Act. Oxygen is listed on the TSCA inventory.

OSHA - Occupational Safety And Health Administration:

29 **CFR 1910.119:**	Process Safety Management of Highly Hazardous Chemicals. Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals as listed in Appendix A. Oxygen is not listed in Appendix A as a highly hazardous chemical.

FDA - Food and Drug Administration:

Oxygen USP is regulated by the FDA as a prescription drug.

CANADIAN REGULATIONS:

Controlled Product Hazard Class A, C. This MSDS has been prepared in compliance with Controlled Product Regulations.

16. OTHER INFORMATION

Special Precautions: All gauges, valves, regulators, piping and equipment to be used in oxygen service must be cleaned for oxygen service in accordance with CGA pamphlet G-4. 1. Use piping and equipment adequately designed to withstand pressures to be

encountered. Oxygen is not to be used as a substitute for compressed air. Never use an oxygen jet for cleaning purposes or any sort, especially clothing, as it increases

the likelihood of an engulfing fire. Use a check valve or other protective apparatus in any line or piping from the cylinder to prevent reverse flows.

Personnel who have been exposed to high concentrations of oxygen should stay in a well-ventilated or open area for 30 minutes before going into a confined space or near an ignition source. Shipment of compressed gas cylinders which have not been filled with the owners consent is a violation of Federal law (49 CFR Part 173.301(b)).

Standard Valve Connections For U.S. and Canada:

Threaded:	0-3 000 psig	CGA 540
	3001-4000 psig	CGA 577
	4001-5500 psig	CGA 701
Pin-Indexed Yoke:	0-3000 psig	CGA 870 (Medical Use)
Ultra High Integrity:	0-3000psig	714

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 you safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Other Information: Use the proper CGA connections, DO NOT USE ADAPTORS

Further information about Oxygen can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), *1725* Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4 120. Telephone: (703) 412-0900

AV-8 Characteristics and Safe Handling of Cryogenic Liquid and Gaseous Oxygen
G-4. I Cleaning Equipment for Oxygen Service
G-4 Oxygen
G-4.3 Commodity Specification for Oxygen
P-i Safe Handling of Compressed Gases in Containers
P- 14 Accident Prevention in Oxygen-Rich and Oxygen-Deficient Atmospheres
SB-2 Oxygen-Deficient Atmospheres
SB-8 Use of Oxy -Fuel Gas Welding and Cutting Apparatus
AV-l Safe Handling and Storage of Compressed Gases

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