



SAFETY DATA SHEET

SECTION 1 – IDENTIFICATION

Chemical Name: Oxygen
Chemical Formula: O₂
Chemical Family: Oxidizing Gas
Hazard Classification: Oxygen, Compressed
Product Use Description: For general analytical/synthetic chemical uses.
Company: MESA Specialty Gases & Equipment
2427 South Anne Street
Santa Ana, California 92704 USA
Phone Number for Information: Infotrac
Emergency Contact: 800-535-5053 (Int'l: 352-323-3500)

SECTION 2 – HAZARD(S) IDENTIFICATION

SIGNAL WORD - DANGER

HAZARD STATEMENTS: May cause or intensify fire; Oxidizer.
Contains gas under pressure; may explode if heated.

PRECAUTIONARY STATEMENTS:

General: Use in accordance with Safety Data Sheets.
Prevention: Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.
Response: Leaking gas fire: Do not extinguish unless leak can be stopped safely. In case of leakage, eliminate all ignition sources. Do not open valve until prepared to use. Always use a back flow preventative device in piping. Use only with equipment of compatible materials of construction and rated for cylinder pressure. Use only with equipment cleaned for oxygen service. Open valve slowly.
Storage: Protect from sunlight. Store in a well-ventilated place.



OTHER HAZARDS: Breathing 51% or more Oxygen at an atmospheric pressure may cause nausea, dizziness, coughing, and bronchial depth of respiration, bradycardia, pulmonary discomfort, central nervous system effects (e.g., mood changes, dizziness), peripheral vasoconstriction, amblyopia (loss of vision), seizures, or death. Long-term exposure to high atmospheric concentrations of oxygen at normal pressure or elevated pressure may produce severe thickening and scarring of lung tissues.

SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	CONCENTRATION (Mol%)
Oxygen	7782-44-7	99.8%
Maximum Impurities		<0.2%

SECTION 4 – FIRST AID MEASURES

ROUTE OF EXPOSURE:

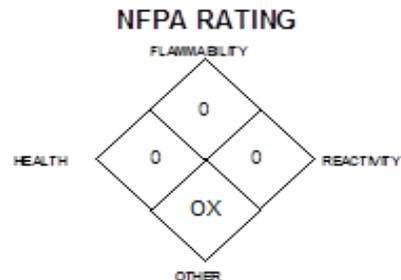
Inhalation: Remove person to uncontaminated area. SCBA may be required to prevent asphyxiation of rescue workers.

Keep warm and at rest. Lay victim face down with head and chest lower than hips to improve drainage from lungs. If breathing is labored, administer pure oxygen. If breathing has stopped, start artificial respiration. Get immediate medical attention for serious exposure.

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. Get immediate medical attention.

Skin contact: Not applicable.

Ingestion: N/A



SYMPTOMS: Breathing 51% or more Oxygen at an atmospheric pressure may cause nausea, dizziness, coughing, bronchial depth of respiration, bradycardia, pulmonary discomfort, central nervous system effects (e.g., mood changes, dizziness), peripheral vasoconstriction, amblyopia (loss of vision), seizures, or death. Long-term exposure to high atmospheric concentrations of oxygen at normal pressure or elevated pressure may produce severe thickening and scarring of lung tissues. Blood hemoglobin concentration decreases (thus reducing oxygen-carrying capacity) with prolonged exposure to high concentrations. Pure oxygen at 1/3 atmospheric pressure can be inhaled for weeks without symptoms. Inhalation of pure oxygen for up to 15 hours per day for many days and 65% oxygen in air for extended periods does not cause symptoms of oxygen toxicity. Contact of the skin or eyes with rapidly expanding gases (which are released under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside.

SECTION 5 – FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Non-flammable gas. Use extinguishing media appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Oxidizing agent; vigorously supports and accelerates combustion. Common combustible materials will burn readily in elevated oxygen environments. Contact with flammable materials may cause fire or explosion. Continue to cool fire exposed cylinders until flames are extinguished. Cylinder valve is equipped with a pressure relief device to safely vent the cylinder if it is exposed to elevated pressure in a fire.

Water Spray: YES

Carbon Dioxide: YES

Foam: YES

Halon: YES

Dry Chemical: YES

Other: Any "ABC" Class

SPECIAL FIRE FIGHTING PROCEDURES: Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Do not enter areas which have more than 23.5% oxygen in the atmosphere, since a serious fire and explosion hazard exists. Remove all flammable and combustible materials from vicinity of a release, if it can be done without risk to firefighters. Direct water onto vessels to keep the vessels cool. Shut off the flow of oxygen or move vessels from fire area if it can be done safely. Withdraw from the area in case of rising sounds from venting safety devices or any discoloration of vessels due to fire.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT, AND EMERGENCY PROCEDURES: Minimum personal protective equipment should be fire protective clothing, mechanically-resistant, fire protective gloves and self-contained breathing apparatus. Do not enter area if the oxygen content exceeds 23.5%. Use ventilation to reduce the oxygen levels. Monitor the surrounding area of oxygen levels.

ENVIRONMENTAL PRECAUTIONS: The atmosphere must have at least 19.5% and less than 23.5% Oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus. Attempt to close the main source valve prior to entering the area. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in-place or remove it to a safe area and allow the gas to be released there.

METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP: Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. Ventilate enclosed areas. Move leaking cylinder to fume hood or safe outdoor area. Use monitoring equipment if hazardous conditions are suspected or likely to occur.

SECTION 7 – HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING: Do not eat or drink while handling chemicals. Be aware of any signs of overexposure (Section 2 & 3). Only experienced and properly instructed persons should handle compressed gases. Person is to know and understand the properties and hazards of the product before use. Do not remove or deface labels provided by the supplier for the identification of the product.

Gas or liquefied gas are to be used with the appropriate pressure regulating control and high pressure equipment. Suck-back into cylinder may cause rupture. Always use a back flow preventative device in piping. Never lift cylinder by its valve protection cap. Use only in ventilated areas.

Before Use: Move cylinders with a suitable hand-truck. Move cylinders properly; do not drag, slide, or drop cylinders when transporting. Use adjustable strap wrench to remove tight/rusted caps. Ensure the complete gas system has been checked for leaks before use. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap, if provided, in place until cylinder is ready for use.

During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment. Never insert any object into valve cap openings; doing so may damage valve causing leakage.

After Use: Close main cylinder valve. Replace valve protection cap. Mark empty cylinders "EMPTY."

NOTE: Use only DOT or ASME code containers. Cylinders must not be recharged except by or with the consent of owner. For additional information, refer to the Compressed Gas Association Pamphlet P-1, Safe Handling of Compressed Gases in Containers.

TANK CAR SHIPMENTS: Tank cars carrying Oxygen should be loaded and unloaded in strict accordance with tank-car owner's recommendations and all established on-site safety procedures. Appropriate personal protective equipment must be used during tank car operations (see Section 8). All loading and unloading equipment must be inspected, prior to each use. Loading and unloading operations must be attended, at all times. Tank cars must be level and wheels must be locked or blocked prior to loading or unloading. Tank car (for loading) or storage tank (for unloading) must be verified to be correct for receiving this product and be properly prepared, prior to starting the transfer operations. Hoses must be verified to be clean and free of incompatible chemicals, prior to connection to the tank car or vessel. Valves and hoses must be verified to be in the correct positions, before starting transfer operations. A sample (if required) must be taken and verified (if required) prior to starting transfer operations. All lines must be blown-down and purged before disconnecting them from the tank car or vessel. Transfers should be performed on concrete surfaces.

CONDITIONS FOR SAFE STORAGE: Cylinders should be secured with mounting brackets away from heavily traveled areas. Use oldest cylinders in stock first to prevent full cylinders from being stored for excessive periods of time. Full and empty cylinders should be segregated. Keep cylinder in dry, cool, well ventilated area away from heat, flame, sparks or corrosive chemicals. Cylinders should be moved by suitable hand trucks. Close valve after each use and when empty. Cylinder valve guards or caps should be in place. Cylinder temperature should not exceed 52°C (125°F). Store containers in location free from fire risk and away from any sources of heat and ignition. Keep cylinder away from combustible material. Use equipment rated for cylinder pressure.

SECTION 8 – EXPOSURE CONTROLS/PERSONAL PROTECTION

COMPONENT	OSHA PEL	ACGIH TLV
Oxygen	Not established	Not established

APPROPRIATE ENGINEERING CONTROLS: Use with adequate ventilation to maintain Oxygen levels between 19.5% and 23.5% in the work area. Local exhaust ventilation is preferred, because it prevents Oxygen dispersion into the work place by eliminating it at its source. If appropriate, install automatic monitoring equipment to detect the level of Oxygen.

INDIVIDUAL PROTECTIVE MEASURES:

Respiratory Protection: Maintain oxygen levels above 19.5% and below 23.5% in the workplace. Use supplied air respiratory protection during emergency response to a release of Oxygen. If a respiratory protection is required, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent State standards. DO NOT ENTER AN AREA IF THE OXYGEN CONTENT EXCEEDS 23.5%.

Eye Protection: Safety glasses.

Hand Protection: Wear mechanically-resistant gloves when handling cylinders of Oxygen.

Body Protection: Use body protection appropriate for task.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Colorless	Upper/lower flammability/explosive limits: N/A
Odor: Odorless	Vapor Pressure: N/A
Odor threshold: No data available	Vapor Density: 1.326 kg/m3 (0.083 lb/ft3)
pH: N/A	Relative Density (Water=1): 1.1
Melting point/range: N/A	Solubility (in water): 4.9%
Boiling point/range: N/A	Partition coefficient (n-octanol/water): N/A
Flash Point: N/A	Auto-ignition temperature: N/A
Evaporation Rate: N/A	Decomposition temperature: N/A
Flammability (solid, gas): N/A	Viscosity: N/A

SECTION 10 – STABILITY AND REACTIVITY DATA

Reactivity: Refer to possibility of hazardous reactions and/or incompatible materials sections	Conditions to avoid: Flame, excessive heat. Avoid contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.
Chemical Stability: Normally Stable	Incompatible materials: Oxygen is incompatible with combustible and flammable materials, chlorinated hydrocarbons, hydrazine, reduced boron compounds, ethers, phosphine, phosphorous tribromide, phosphorous trioxide, tetrafluorethylene, and compounds which readily form peroxides.
Possibility of hazardous reactions: No data available	Hazardous Decomposition or Byproducts: None

SECTION 11 – TOXICOLOGICAL INFORMATION

LIKELY ROUTES OF EXPOSURE:

Oxygen is the vital element in the atmosphere in which we live and breathe. The following toxicity data are for oxygen and are for exposure to high levels in extreme situations:

Cytogenetic Analysis System (hamster lung) 80 pph

TCLo (inhalation-woman) 12 pph for 10 minutes. Teratogenic effects.

TCLo (inhalation-human) 100 pph for 14 hours. Pulmonary effects.

SYMPTOMS/EFFECTS FROM EXPOSURE: Breathing 51% or more Oxygen at an atmospheric pressure may cause nausea, dizziness, coughing, and bronchial depth of respiration, bradycardia, pulmonary discomfort, central nervous system effects (e.g., mood changes, dizziness), peripheral vasoconstriction, amblyopia (loss of vision), seizures, or death. Long-term exposure to high atmospheric concentrations of oxygen at normal pressure or elevated pressure may produce severe thickening and scarring of lung tissues. Blood hemoglobin concentration decreases (thus reducing oxygen-carrying capacity) with prolonged exposure to high concentrations. Pure oxygen at 1/3 atmospheric pressure can be inhaled for weeks without symptoms. Inhalation of pure oxygen for up to 15 hours per day for many days and 65% oxygen in air for extended periods does not cause symptoms of oxygen toxicity. Contact of the skin or eyes with rapidly expanding gases (which are released under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside.

ACUTE/CHRONIC TOXICITY: SUSPECTED CANCER AGENT: Oxygen is not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, IARC; therefore it is not considered to be, nor suspected to be a cancer-causing agent by these agencies.

IRRITANCY OF PRODUCT: Contact with rapidly expanding gases or the refrigerated liquid can cause frostbite and damage to exposed skin and eyes.

SENSITIZATION OF PRODUCT: Oxygen is not a sensitizer.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of Oxygen on the human reproductive system.

Mutagenicity: Oxygen is not expected to cause mutagenic effects in humans. High concentrations of Oxygen at atmospheric pressure caused chromosomal aberrations and mutations in specific test animal tissues.

Embryotoxicity: Oxygen is not expected to cause embryotoxic effects in humans.

Teratogenicity: Oxygen is not expected to cause teratogenic effects in humans. Exposure of pregnant hamsters to 3-4 atmospheres of 100% oxygen for periods of 2-3 hours on days 6, 7, and 8 of pregnancy produced teratogenic effects in small, but significant number of fetuses.

Reproductive Toxicity: Oxygen is not expected to cause adverse reproductive effects in humans.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing respiratory conditions may be aggravated by overexposure to Oxygen.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and reduce overexposure. Symptoms of overexposure usually are relieved quickly. Immediate sedation and anticonvulsive therapy should be provided, as needed.

CARCINOGENICITY: No data available.

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicity (aquatic and terrestrial): No known effects. Any adverse effect on animals would be related to oxygen deficient environments, as well as respiratory system damage. Additionally, frost produced in the presence of rapidly expanding gases may adversely affect plant life.

Persistence and degradability: No data available

Bioaccumulative potential: No data available

Mobility in soil: No data available

Other Effects: The mixture does not contain any class I or Class II ozone depleting chemicals.

SECTION 13 – DISPOSAL CONSIDERATIONS

Disposal: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Return cylinders with any residual product to MESA Specialty Gas & Equipment Inc. Do not dispose of locally.

SECTION 14 – TRANSPORTATION INFORMATION

DOT Classification (Gas):

Proper Shipping Name: Oxygen, compressed
Class: 2.2
UN/ID No.: UN1072
Label: Non-flammable Gas, Oxidizer

Environment hazard: No

Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code: N/A

SPECIAL PRECAUTIONS FOR USER: Avoid transport on vehicles where the load space is not separated from driver's compartment. Ensure that transporter is aware of the potential hazards of the load and knows what to do in event of an emergency. Contact supplier for complete transportation information.

SECTION 15 – REGULATORY INFORMATION

U.S. SARA REPORTING REQUIREMENTS: Oxygen is not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: Not applicable.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

CANADIAN DSL/NDL INVENTORY STATUS: Oxygen is on the DSL Inventory.

U.S. TSCA INVENTORY STATUS: Oxygen is on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

U.S. STATE REGULATORY INFORMATION: Oxygen is covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: No. California - Permissible Exposure Limits for Chemical Contaminants: No. Florida - Substance List: Oxygen. Illinois - Toxic Substance List: No.

Kansas - Section 302/313 List: No. Massachusetts - Substance List: Oxygen.

Minnesota - List of Hazardous Substances: No. Michigan - Critical Materials Register: No.

Missouri - Employer Information/Toxic Substance List: No. New Jersey - Right to Know Hazardous Substance List: Oxygen. North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.

Pennsylvania - Hazardous Substance List: Oxygen. Rhode Island - Hazardous Substance List: Oxygen.

Texas - Hazardous Substance List: No. West Virginia - Hazardous Substance List: No.

Wisconsin - Toxic and Hazardous Substances: No.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): Oxygen is not on the California Proposition 65 lists.

Labeling:

DANGER: May cause or intensify fire; Oxidizer . Contains gas under pressure; May explode if heated. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources—No smoking. Use and store in well-ventilated areas. Leaking gas fire: Do not extinguish unless leak can be stopped safely. In case of leakage, eliminate all ignition sources. Do not open valve until prepared to use. Always use a backflow preventative device in piping. Use only with equipment cleaned for oxygen service. Use only with equipment of compatible materials of construction and rated for cylinder pressure. Close valve after each use and when empty. Cylinder temperature should not exceed 52°C (125°F). Use in accordance with Safety Data Sheet. **FIRST AID:** IF INHALED, remove to fresh air. If breathing is difficult, give Oxygen. Call a physician. **IN CASE OF FROSTBITE,** obtain immediate medical attention. **DO NOT REMOVE THIS LABEL.**

TARGET ORGANS: Hyperbaric Oxygen: Respiratory system and Central Nervous System.

SECTION 16 – OTHER INFORMATION

Information contained in this data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable. But the accuracy and completeness thereof, is not guaranteed and no warranty of any kind, either expressed or implied, is made with respect thereto. Since MESA Specialty Gases and Equipment Division of MESA International Technologies, Inc. shall have no control over the use of the product described herein, we assume no liability for loss or damage incurred from the proper or improper use of such product.

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