Oxygen, compressed

Safety Data Sheet P-4638

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1979 Revision date: 10/21/2016 Supersedes: 06/23/2015

SECTION: 1. Product and company identification

1.1. Product identifier

Product form	:	Substance
Name	:	Oxygen, compressed
CAS No	:	7782-44-7
Formula	:	O2
Other means of identification	:	Oxygen, Compressed; MediPure Oxygen; Aviator's Breathing Oxygen; USP Oxygen; Oxygen - Diving Grade

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	:	Medical applications Industrial use Diving Gas (Underwater Breathing)

1.3. Details of the supplier of the safety data sheet

Praxair, Inc.
10 Riverview Drive
Danbury, CT 06810-6268 - USA
T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146
www.praxair.com

1.4. Emergency telephone number

Emergency number	:	Onsite Emergency: 1-800-645-4633 CHEMTREC, 24hr/day 7days/week — Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887 (collect calls accepted, Contract 17729)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-US classification

Ox. Gas 1 H270
Compressed gas H280

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS03 GHS04

Signal word (GHS-US)	:	DANGER
Hazard statements (GHS-US)	:	H270 - MAY CAUSE OR INTENSIFY FIRE; OXIDIZER H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
Precautionary statements (GHS-US)	:	P202 - Do not handle until all safety precautions have been read and understood P220 - Keep/Store away from combustible materials, clothing P244 - Keep reduction valves/valves and fittings free from oil and grease P271+P403 - Use and store only outdoors or in a well-ventilated place P370+P376 - In case of fire: Stop leak if safe to do so CGA-PG05 - Use a back flow preventive device in the piping CGA-PG20+CGA-PG10 - Use only with equipment of compatible materials of construction and rated for cylinder pressure CGA-PG22 - Use only with equipment cleaned for oxygen service CGA-PG21 - Open valve slowly

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CGA-PG06 - Close valve after each use and when empty
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)

2.3. Other hazards

Other hazards not contributing to the classification : Breathing 80 percent 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 central nervous system (CNS) effects, resulting in dizziness, poor coordination, tingling sensation, visual and hearing disturbances, muscular twitching, unconsciousness, and convulsions. Breathing oxygen under pressure may cause prolongation of adaptation to darkness and reduced peripheral vision.

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substance

Name : Oxygen, compressed

CAS No : 7782-44-7

Name	Product identifier	%
Oxygen	(CAS No) 7782-44-7	99.5 - 100

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Move to fresh air. Get medical advice/attention.

First-aid measures after skin contact : Adverse effects not expected from this product.

First-aid measures after eye contact : Adverse effects not expected from this product. In case of eye irritation: Rinse immediately with plenty of water. Consult an ophthalmologist if irritation persists.

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

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Vigorously accelerates combustion. Use media appropriate for surrounding fire. Water (e.g, safety shower) is the preferred extinguishing media for clothing fires.

5.2. Special hazards arising from the substance or mixture

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

5.3. Advice for firefighters

Firefighting instructions : High-pressure, oxidizing gas

Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

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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	: Heat of fire can build pressure in container and cause it to rupture. Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.) No part of the container should be subjected to a temperature higher than 125°F (52°C). Smoking, flames, and electric sparks in the presence of enriched oxygen atmospheres are potential explosion hazards.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Ensure adequate air ventilation. Eliminate ignition sources. Evacuate area. Try to stop release. Monitor concentration of released product. Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Stop leak if safe to do so.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Try to stop release.

6.3. Methods and material for containment and cleaning up

No additional information available

6.4. Reference to other sections

See also sections 8 and 13.

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.
Safe use of the product	: **The suitability of this product as a component in underwater breathing gas mixtures** is to be determined by or under the supervision of personnel experienced in the use of underwater breathing gas mixtures and familiar with the physiological effects, methods employed, frequency and duration of use, hazards, side effects, and precautions to be taken.

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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/No 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. 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.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Oxygen, compressed (7782-44-7)	
ACGIH	Not established
USA OSHA	Not established

Oxygen (7782-44-7)	
ACGIH	Not established
USA OSHA	Not established

8.2. Exposure controls

Appropriate engineering controls : Avoid oxygen rich (>23.5%) atmospheres. Use a local exhaust system with sufficient flow velocity to maintain an adequate supply of air in the worker's breathing zone. Mechanical (general): General exhaust ventilation may be acceptable if it can maintain an adequate supply of air.

Eye protection : Wear safety glasses with side shields.

Skin and body protection : Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves during cylinder changeout or wherever contact with product is possible. Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138. As needed for welding, wear hand, head, and body protection to help prevent injury from radiation and sparks. (See ANSI Z49.1.) At a minimum, this includes welder's gloves and protective goggles, and may include arm protectors, aprons, hats, and shoulder protection as well as substantial clothing.

Respiratory protection : When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Appearance : Colorless gas.

Molecular mass : 32 g/mol

Color : Colorless.

Odor : No odor warning properties.

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Odor threshold	: No data available
pH	: Not applicable.
Relative evaporation rate (butyl acetate=1)	: No data available
Relative evaporation rate (ether=1)	: Not applicable.
Melting point	: -219 °C (-362°F)
Freezing point	: No data available
Boiling point	: -183 °C (-297°F)
Flash point	: Not applicable.
Critical temperature	: -118.6 °C (-181.48°F)
Auto-ignition temperature	: Not applicable.
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: Not applicable.
Critical pressure	: 50.4 bar (731.4 psia)
Relative vapor density at 20 °C	: 0.0827 lb/ft3 (1.325 kg/m3) absolute vapor density at 70°F/21.1°C, 1 atm
Relative density	: 1.1
Density	: 1.4289 kg/m³ (at 21.1 °C)
Relative gas density	: 1.1
Solubility	: Water: 39 mg/l
Log Pow	: Not applicable.
Log Kow	: Not applicable.
Viscosity, kinematic	: Not applicable.
Viscosity, dynamic	: Not applicable.
Explosive properties	: Not applicable.
Oxidizing properties	: Oxidizer.
Explosion limits	: No data available

9.2. Other information

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

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Violently oxidizes organic material.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

Keep equipment free from oil and grease. Consider the potential toxicity hazard due to the presence of chlorinated or fluorinated polymers in high pressure (> 30 bar) oxygen lines in case of combustion. May react violently with combustible materials. May react violently with reducing agents.

10.6. Hazardous decomposition products

None.

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SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

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 : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

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

12.2. Persistence and degradability

Oxygen, compressed (7782-44-7)	
Persistence and degradability	No ecological damage caused by this product.

Oxygen (7782-44-7)	
Persistence and degradability	No ecological damage caused by this product.

12.3. Bioaccumulative potential

Oxygen, compressed (7782-44-7)	
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

Oxygen (7782-44-7)	
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

12.4. Mobility in soil

Oxygen, compressed (7782-44-7)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.

Oxygen (7782-44-7)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.

12.5. Other adverse effects

Effect on ozone layer : None

Effect on the global warming : No known effects from this product

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SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

SECTION 14: Transport information

In accordance with DOT

Transport document description : UN1072 Oxygen, compressed, 2.2

UN-No.(DOT) : UN1072

Proper Shipping Name (DOT) : Oxygen, compressed

Class (DOT) : 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115

Hazard labels (DOT) : 2.2 - Non-flammable gas
5.1 - Oxidizer



DOT Special Provisions (49 CFR 172.102) : 110 - Fire extinguishers transported under UN1044 may include installed actuating cartridges (cartridges, power device of Division 1.4C or 1.4S), without changing the classification of Division 2.2, provided the aggregate quantity of deflagrating (propellant) explosives does not exceed 3.2 grams per extinguishing unit
A14 - This material is not authorized to be transported as a limited quantity or consumer commodity in accordance with 173.306 of this subchapter when transported aboard an aircraft

Additional information

Emergency Response Guide (ERG) Number : 122 (UN1072)

Other information : No supplementary information available.

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

UN-No. (IMDG) : 1072

Proper Shipping Name (IMDG) : OXYGEN, COMPRESSED

Class (IMDG) : 2 - Gases

MFAG-No : 122

Air transport

UN-No. (IATA) : 1072

Proper Shipping Name (IATA) : Oxygen, compressed

Class (IATA) : 2

Civil Aeronautics Law : Gases under pressure/Gases nonflammable nontoxic under pressure

SECTION 15: Regulatory information

15.1. US Federal regulations

Oxygen, compressed (7782-44-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 311/312 Hazard Classes	Sudden release of pressure hazard Fire hazard

All components of this product are listed on the Toxic Substances Control Act (TSCA) inventory.

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This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

15.2. International regulations

CANADA

Oxygen, compressed (7782-44-7)
Listed on the Canadian DSL (Domestic Substances List)

Oxygen (7782-44-7)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Oxygen, compressed (7782-44-7)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2. National regulations

Oxygen, compressed (7782-44-7)
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 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 INSQ (Mexican National Inventory of Chemical Substances)

15.3. US State regulations

Oxygen, compressed(7782-44-7)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

Oxygen (7782-44-7)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL)
No	No	No	No	

Oxygen (7782-44-7)
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

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SECTION 16: Other information

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

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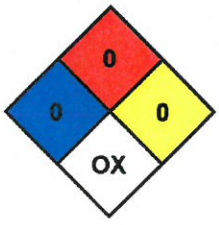
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NFPA health hazard : 0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.

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 : 0 Minimal Hazard - No significant risk to health

Flammability : 0 Minimal Hazard

Physical : 3 Serious Hazard

SDS US (GHS HazCom 2012) - 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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