



Oxygen, Refrigerated

Safety Data Sheet

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product Name OXYGEN, REFRIGERATED LIQUID

Other means of identification

Safety data sheet number SDS-YO-015

UN/ID no. UN1073

Trade name LIQUID OXYGEN, LOX, OXYGEN LIQUID - 99.5

Recommended use of the chemical and restrictions on use

Recommended Use Industrial and professional use. Medical.

Uses advised against Consumer use

Details of the supplier of the safety data sheet

Yateem Oxygen W.L.L

P.O. Box 60, Manama, Bahrain

Email: wecare@yateemoxygen.com

Website: www.yateemoxygen.com

Customer Service: +973 17400677

Emergency telephone number

Company Phone Number +973 17400456

Emergency Contact Number +973 17456248; +973 17400675

SECTION 2: Hazards identification

Classification

OSHA Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

Oxidizing gases	Category 1
Gases under pressure	REFRIGERATED LIQUID

Label elements

Signal word

Warning

Hazard Statement

Contains refrigerated gas; may cause cryogenic burns or injury

May cause or intensify fire; **oxidizer**

Contains gas under pressure; May explode if heated



Precautionary Statements - Prevention

Do not handle until all safety precautions have been read and understood

Keep and store away from clothing and other combustible materials

Keep valves and fittings free from grease and oil Use and store only outdoors or in a well-ventilated place

Use a backflow preventive device in piping

Use only equipment of compatible materials of construction and rated for cylinder pressure

Use only with equipment cleaned for oxygen service

Open valve slowly Close valve after each use and when empty

Always keep container in upright position

Precautionary Statements – Response:

IF ON SKIN: Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention. In case of fire: Stop leak if safe to do so

Hazards not otherwise classified (HNOC)

Not applicable

SECTION 3: Composition/information on ingredients

Chemical Name	CAS No.	Volume %	Chemical Formula
OXYGEN	7782-44-7	>99	O ₂

SECTION 4: First aid measures

Description of first aid measures

General advice	Show this safety data sheet to the doctor in attendance.
Inhalation	Move victim to fresh air. Seek immediate medical attention/advice.
Skin contact	For dermal contact or suspected frostbite, remove contaminated clothing and flush affected areas with lukewarm water. DO NOT USE HOT WATER. A physician should see the patient promptly if contact with the product has resulted in blistering of the dermal surface or in deep tissue freezing.
Eye contact	If frostbite is suspected, flush eyes with cool water for 15 minutes and obtain immediate medical attention.
Ingestion	Not an expected route of exposure

Most important symptoms and effects, both acute and delayed

Symptoms	Oxygen is not acutely toxic under normal pressure. Oxygen is more toxic when inhaled at elevated pressures. Depending upon pressure and duration of exposure, pure oxygen at elevated pressures may cause cramps, dizziness, difficulty breathing, convulsions, edema and death. Contact with evaporating liquid may cause cold burns/frostbite
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Indication of any immediate medical attention and special treatment needed

Note to physicians	Treat symptomatically.
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SECTION 5: Firefighting measures

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media None

Specific extinguishing methods

Continue to cool fire exposed cylinders until flames are extinguished. Damaged cylinders should be handled only by specialists.

Specific hazards arising from the chemical

May cause or intensify fire; oxidizer. Will support and accelerate combustion of combustible materials (wood, paper, oil, debris, etc). Cylinders may rupture under extreme heat.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, NIOSH (approved or equivalent) and full protective gear.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions	Evacuate personnel to safe areas. Ensure adequate ventilation, especially in confined areas. Avoid spills. Do not walk on or roll equipment over spills. Monitor oxygen level. Eliminate all ignition sources if safe to do so. Use personal protection recommended in Section 8.
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Environmental precautions

Environmental precautions	Prevent spreading of vapors through sewers, ventilation systems and confined areas.
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Methods and material for containment and cleaning up

Methods for containment Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. If leak is in container or container valve, contact the appropriate emergency telephone number in Section 1 or call your closest Yateem Oxygen location.

Methods for cleaning up Return cylinder to Yateem Oxygen

SECTION 7. Handling and Storage

Precautions for safe handling

Advice on safe handling

Liquid oxygen cannot be handled in carbon or low alloy steel, 18-8 and 18-10 stainless steel are acceptable as are copper and its alloys, brass bronze, silicon alloys, Monel®, Inconel®, and beryllium. Teflon®, Teflon® composites, or Kel-F® are preferred non-metallic gasket materials. Oxygen should not be used as a substitute for compressed air in pneumatic equipment since they generally contain flammable lubricants. Equipment able to use oxygen must be "cleaned for oxygen service". Check with the equipment supplier to verify oxygen compatibility for the service conditions. Keep valves and fittings free from grease and oil. Use only equipment of compatible materials of construction. Do NOT change or force fit connections. Open valve slowly. "NO SMOKING" signs should be posted in storage and use areas. Separate flammable gas cylinders from oxygen and other oxidizers by a minimum distance of 20 ft. or by a 5 ft. high barrier with a minimum fire resistance rating of a half an hour. Never allow any unprotected part of the body to touch uninsulated pipes or vessels that contain cold fluids. The extremely cold metal will cause moist flesh to stick fast and tear when one attempts to withdraw from it. Stationary customer site vessels should be operated in accordance with the manufacturer's and Linde's instruction. Do not attempt to repair, adjust or in any other way modify the operation of these vessels. If there is a malfunction or other type of operations problem with the vessel, contact the closest Linde location immediately for assistance.

Protect cylinders from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distance, use a cart designed to transport cylinders. Never attempt to lift a cylinder by its valve protection cap. Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing leak to occur. Use an adjustable strap wrench to remove over-tight or rusted caps. Use only with adequate ventilation. Use a backflow preventive device in piping. Use only with equipment rated for cylinder pressure. Close valve after each use and when empty. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Ensure the complete gas system has been checked for leaks before use.

Never put cylinders into trunks of cars or unventilated areas of passenger vehicles. Never attempt to refill a compressed gas cylinder without the owner's written consent. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit.

Only experienced and properly instructed persons should handle gases under pressure. Always store and handle compressed gas cylinders in accordance with Compressed Gas Association, pamphlet CGA-P1, Safe Handling of Compressed Gases in Containers.

For additional recommendations, consult Compressed Gas Association's Pamphlets SB-7, G-4.3, G-4.1, G-4.4, P-2.5, G-4.9, P-14, and SB-2

Conditions for safe storage, including any incompatibilities

Storage Conditions Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Keep at temperatures below 52°C / 125°F. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders from being stored for excessive periods of time. Stored containers should be periodically checked for general condition and leakage

Incompatible materials Combustible materials. Organic material. Reducing agents. Oil. Grease.

SECTION 8: Exposure controls/personal protection

Control parameters

Exposure Guidelines This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region-specific regulatory bodies

Engineering Controls Showers. Eyewash stations. Use local exhaust in combination with general ventilation as necessary to keep oxygen concentrations below 23.5%. Consider installation of leak detection systems in areas of use and storage. Systems under pressure should be regularly checked for leakages

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles).
If splashes are likely to occur, wear: Goggles. Face-shield.

Skin and body protection Work gloves and safety shoes are recommended when handling cylinders. Gloves must be clean and free from grease or oil. Wear cold insulating gloves when handling liquid.

Respiratory protection No special protective required
General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.
Do not get in eyes, on skin, or on clothing

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Physical state	Gas
Appearance	Pale blue
Odor	Odorless
Odor threshold	No information available
pH	Not applicable
Melting/freezing point	-218.8 °C / -361.8 °F
Evaporation rate	Not applicable
Flammability (solid, gas)	see Section 5
Lower flammability limit:	Not applicable
Upper flammability limit:	Not applicable
Flash point	Not applicable
Autoignition temperature	No data available
Decomposition temperature	No data available
Oxidizing properties	Oxidizer
Water solubility	Slightly soluble
Partition coefficient	0.65
Kinematic viscosity	Not applicable

Chemical Name	Molecular weight	Boiling point / range	Vapor Pressure	Vapor density (air =1)	Gas Density kg/m ³ @20°C	Critical Temperature
OXYGEN	31.99	-182.9 °C	Above critical temperature	1.11	1.331	-118.6 °C

SECTION 10: Stability and Reactivity

Reactivity

Not reactive under normal conditions

Chemical stability

Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None

Sensitivity to Static Discharge None

Possibility of Hazardous Reactions

May cause or intensify fire; oxidizer.

Will support and accelerate combustion of combustible materials (wood, paper, oil, debris, etc).

Conditions to avoid

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

Incompatible materials

Reducing agents. Combustible material. Organic material. Oil. Grease.

Hazardous Decomposition Products

None known.

SECTION 11: Toxicological Information

Information on likely routes of exposure

Inhalation	Symptoms of overexposure are dizziness, headache, tiredness, nausea, unconsciousness, cessation of breathing. Poisoning began in dogs 36 hours after inhalation of pure oxygen at atmospheric pressure. Distress was seen within 48 hours and death within 60 hours.
Skin contact	Contact with evaporating liquid may cause cold burns/frostbite.
Eye contact	The incompletely developed retinal circulation is more susceptible to toxic levels of oxygen. In premature infants, arterial oxygen tension above 150 mm Hg may cause retrolental fibroplasia. Permanent blindness may occur several months later. One case of severe retinal damage in an adult was reported. An individual suffering from myasthenia gravis developed irreversible retinal atrophy after breathing 80% oxygen for 150 days
Ingestion	Not an expected route of exposure.

Information on toxicological effects

Symptoms	Oxygen is not acutely toxic under normal pressure. Oxygen is more toxic when inhaled at elevated pressures. Depending upon pressure and duration of exposure, pure oxygen at elevated pressures may cause cramps, dizziness, difficulty breathing, convulsions, edema and death
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Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation	Not classified.
Sensitization	Not classified.
Germ cell mutagenicity	Not classified.
Carcinogenicity	It does not contain any carcinogens or potential carcinogens listed by OSHA, IARC or NTP.
Reproductive toxicity	Not classified.
Developmental Toxicity	Not classified.
STOT - single exposure	Not classified.
STOT - repeated exposure	Not classified.
Chronic toxicity	Prolonged inhalation of high oxygen concentrations >75% may affect coordination, attention and cause tiredness of respiratory irritation.,
Aspiration hazard	Not applicable.
<u>Numerical measures of toxicity</u>	
ORAL LD50	No information available

SECTION 12: Ecological Information

Ecotoxicity

No known acute aquatic toxicity.

Persistence and degradability

Not applicable.

Bioaccumulation

Will not bioconcentrate.

SECTION 13. Disposal Considerations

Waste treatment methods

Disposal of wastes

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to YATEEM OXYGEN for proper disposal. This material, as supplied, is a hazardous waste according to federal regulations (40 CFR 261).

SECTION 14. Transportation Information

DOT

UN/ID no.	UN1073
Proper shipping name	Oxygen, refrigerated liquid
Hazard Class	2.2
Subsidiary class	5.1
Special Provisions	T75, TP5, TP22
Description	UN1073, Oxygen, refrigerated liquid, 2.2 (5.1)
Emergency Response Guide Number	122

TDG

UN/ID no.	UN1073
Proper shipping name	Oxygen, refrigerated liquid
Hazard Class	2.2
Subsidiary class	5.1
Description	UN1073, Oxygen, refrigerated liquid, 2.2 (5.1)

IATA

Description	Forbidden by Passenger Air Forbidden
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IMDG

UN/ID no.	UN1073
Proper shipping name	Oxygen, refrigerated liquid
Hazard Class	2.2
Subsidiary class	5.1
EmS-No.	F-C, S-W
Special provisions	355
Description	UN1073, Oxygen, refrigerated liquid, 2.2 (5.1)

SECTION 15. Regulatory Information

National Legislation Complies

SEC <https://www.sce.gov.bh/en/index>

MTT <http://www.transportation.gov.bh/content/caa-laws-and-regulations>

OHSC <http://www.scosh.org/en/legislation/legislations#legislationContainer>

International Inventories

TSC :Complies

DSL/NDSL :Complies

EINECS/ELINCS : Complies

Legend

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

SEC – Specific Council of Environment

MTT – Ministry of Transport and Telecommunications;

OHSC - Occupational Health and Safety Council

SECTION 16: Other Information

<u>NFPA</u>	Health hazards 0	Flammability 0	Instability 0	Physical and Chemical Properties- OX
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Note: Ratings were assigned in accordance with Compressed Gas Association (CGA) guidelines as published in CGA Pamphlet P-19-2009, CGA Recommended Hazard Ratings for Compressed Gases, 3rd Edition.

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End of Safety Data Sheet