




Oxygen, Liquid

Section 1, Identification

Product Name	: Oxygen, refrigerated liquid
Formula	: O ₂
Other means of identification	: Liquid oxygen, LOX
Product use	: Industrial use, Medical application, Diving gas, Laser application
Supplier's details	: WKS INDUSTRIAL GAS PTE LTD 22 Tuas Avenue 10 Singapore 639145 T-6898 2292, F-6898 2202 info@wks.com.sg / www.wks.com.sg

Section 2, Hazard(s) identification

Classified as Hazardous under OSHA Hazard Communication Standard (29 CFR 1910.1200)

GHS Classification	: Oxidizing gases: Category 1 : Gases under pressure – Refrigerated liquefied gas.
Hazard pictogram(s)	: 
Signal word	: Danger.
Hazard statement(s)	: H270 May cause or intensify fire; oxidizer. : H281 Contains refrigerated gas: may cause cryogenic burns or injury. : OSHA-H01 May displace oxygen and cause rapid suffocation.
Precautionary statement(s)	: P202 Do not handle until all safety precautions have been read and understood. : P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking. : P220 Keep/Store away from clothing/.../combustible materials. : P244 Keep reduction valves free from grease and oil. : P370+P376 In case of fire, stop leak if safe to do so. : P271 Use only outdoors or in a well-ventilated area. : P282 Wear cold insulating gloves, face shield, eye protection. : P403 Store in a well-ventilated area. : CGA-PG06 Close valve after each use and when empty. : CGA-PG23 Always keep container in upright position. : Not Applicable.
Disposal	: None known.
Hazards not otherwise classified	: None known.
Hazchem code	: 2P
H S code	: 28044000

Section 3, Composition/information on ingredients

Name	: Oxygen, refrigerated liquid.
CAS No.	: 7782-44-7
%	: >99.8%



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Section 4, First-aid measures

Description of First-Aid measures

- Inhalation** : Move victim to fresh air and keep at rest in a comfortable position. Seek medical advice/attention if required.
- Skin contact** : Flush with plenty of water. Remove contaminated clothing and wash before reuse. Seek medical attention.
- Eye contact** : Immediately flush eyes thoroughly with water for at least 15 minutes. Check and remove any contact lenses. Hold eyelids apart and ensure all surfaces are flushed thoroughly. Seek medical attention.
- Ingestion** : Ingestion is not considered a potential route of exposure.

Most important symptoms and effects, both acute and delayed

Direct contact with liquid or escaping gas may cause cold burns/frostbite.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

Section 5, Fire-fighting measures

Extinguishing media

Use an extinguishing agent appropriate for surrounding fire.

Special hazards arising from the substance or mixture

Oxidizing agent. Support combustion and contact with flammable materials may cause fire or explosion.

Advice for firefighters

Extremely cold liquid and gas under pressure. Evacuate all personnel. Heat from fire will increase temperatures in cylinder and may cause cylinder to rupture. Cool cylinders or containers by applying water from a safe distance. Stop flow of gas if safe to do so. Remove cylinders from path of fire if safe to do so. Use self-contained breathing apparatus and protective clothing.

Section 6, Accidental release measures

Personal precautions, protective equipment and emergency procedures

- Non-emergency personnel** : Evacuate area. Eliminate ignition sources. Do not touch or walk through spilled materials. Ensure adequate air ventilation and wear appropriate respirator when ventilation is inadequate. Wear PPE.
- For emergency responders** : If specialised clothing is required to deal with spillage, refer to Section 8 on suitable and unsuitable materials. See also information in "Non-emergency personnel".
- Environmental precautions** : Try to stop release. Prevent from entering sewers, basement, work pits or any place where its accumulation can be dangerous.

Methods and materials used for containment cleaning up

Stop leak if without risk. Carefully move cylinder to well-ventilated remote area and allow discharge if safe to do so. Refer to Section 8 & 13.

Section 7, Handling and storage

Precautions for safe handling

Contain under pressure. Do not drag, roll, drop or slide cylinder. Do not puncture or incinerate cylinder. Open valve slowly and close after use. Keep cylinders in well-ventilated place. Never allow any unprotected part of the body to touch uninsulated pipes or vessels that contain cryogenic liquids.



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Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store cylinders only where temperature will not exceed 52°C. Keep cylinder tightly closed until ready for use. Store full and empty cylinders separately and on firm level floor. Use a first-in, first-out inventory system to prevent storing full containers for long periods.

Section 8, Exposure controls/personal protection

Control parameters

Exposure standards : Not established.

Biological limits : Not established.

Exposure controls

Engineering controls : Use in well-ventilated area. Avoid oxygen rich (>23.5%) atmospheres. Provide adequate exhaust ventilation.

Individual protection measures

PPE

Eye / face : Safety glasses with side shields.

Hand : leather or insulated gloves.

Body : Safety boots.

Respiratory : In oxygen-deficient atmospheres, self-contained breathing apparatus (SCBA) or an air-line respirator is to be used.

Section 9, Physical and chemical properties

Physical state : Gas, cryogenic liquid.

Colour : Bluish liquid.

Odour : Odourless.

Odour threshold : Not available.

Molecular mass : 32 g/mole

pH : Not applicable.

Melting point : -218.8°C

Boiling point : -183°C

Critical temperature : -118.4°C

Critical pressure : 729.1 psia

Flash point : Not applicable.

Evaporation rate : Not applicable.

Flammability (solid, gas) : Not available.

Upper/lower explosive limits : Not available.

Vapour pressure : Not available.

Vapour density : Not available.

Relative gas density : 1.1 (Air = 1)

Solubility (water) : 39 mg/l

Oxidizing properties : Oxidising liquid

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Not available.

Section 10, Stability and reactivity

Reactivity : No additional information available.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : May cause fire if in contact with combustible materials.

Conditions to avoid : Avoid sparks, heat, open flames and other ignition sources.

Incompatible materials : Oil, grease, combustible materials & reducing agents.

Hazardous decomposition products : None.



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Section 11, Toxicological information

Acute toxicity	: Not classified.
Corrosion/irritation	: Not classified.
Sensitization	: Not classified.
Mutagenicity	: Not classified.
Carcinogenicity	: Not classified.
Reproductive toxicity	: Not classified.
STOT (single exposure)	: Not classified.
STOT (repeated exposure)	: Continuous inhalation of concentrations higher than 75% may cause nausea, dizziness, respiratory difficulty and convulsion.
Aspiration hazard	: Not classified.







Section 12, Ecological information

Toxicity	: No ecological damage caused by this product.
Persistence and degradability	: Not available.
Bioaccumulative potential	: Not available.
Mobility in soil	: Not available.
Other adverse effects	: No known effects from this product.

Section 13, Disposal considerations

Disposal	: Do not attempt to dispose of residual or unused quantities. Return container to supplier.
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Section 14, Transport information

	Land Transport	Sea transport	Air Transport
UN number	UN1073	UN1073	UN1073
UN proper shipping name	OXYGEN, REFRIGERATED LIQUID	OXYGEN, REFRIGERATED LIQUID	OXYGEN, REFRIGERATED LIQUID
Transport hazard class(es)	2.2 (5.1)  	2.2 (5.1)  	2.2 (5.1)  
Packing group	None allocated	None allocated	None allocated
Environmental hazards	No	No	No

Additional information	: Ensure cylinder is separated from driver's compartment. Ensure driver is aware of the potential hazards of product and know what to do in the event of an accident or an emergency. Ensure that cylinders are properly secured and valves are closed.
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Section 15, Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture	: Ensure all local regulations or legislations are observed.
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Section 16, Other information

H281 CONTAINS REFRIGERATED GAS; MAY CAUSE CRYOGENIC BURNS/FROSTBITE

The hazard of asphyxiation is often overlooked and must be stressed before use. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Whilst all due care has been taken in the preparation of this document and since the company shall have no control of the use of the product described herein, the Company assumes no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person because of their reliance on the information contained in this SDS.