



Safety advice.

Compressed gases

Safety Data Sheet

OXYGEN

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1. PRODUCT AND COMPANY IDENTIFICATION

Product Name OXYGEN

UN-Number UN1072

Recommended Use: [Not to be used as a substitute for Oxygen i.p. (medical oxygen)]

Synonyms LASER Oxygen; IOLAR Oxygen, Compressed Oxygen

Linde India Limited
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Manufacturer's Registered Office

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2. HAZARDS IDENTIFICATION

WARNING!

EMERGENCY OVERVIEW

Non-toxic, Oxidizer, Accelerates combustion
Contact with combustible material / combustible condition may cause fire or explosion
Contact with combustible & content under pressure.
Prolonged inhalation of high concentrations may cause coughing and lung effect
High pressure compressed gas
Keep at temperatures below 52°C / 125°F

Appearance Colorless
Physical State Compressed Gas
Odor Odorless

OSHA Regulatory Status This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

POTENTIAL HEALTH EFFECTS:

- **Principle Routes of Exposure:** Inhalation
- **Acute Toxicity**
- **Inhalation:** 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.
- **Eyes:** None known. Contact with rapidly expanding gas near the point of release may cause frostbite severe harm.
- **Skin:** None known. Contact with rapidly expanding gas near the point of release may cause severe harm.
- **Skin Absorption Hazard:** No known hazard in contact with skin.
- **Ingestion:** None known
- **Chronic Effects:** Prolonged inhalation of high oxygen concentrations (>75%) may affect coordination, attention, and cause tiredness or respiratory irritation
- **Aggravated Medical Conditions:** Chronic obstructive pulmonary disease
- **Environmental Hazard:** See Section 12 for additional Ecological Information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Chemical Name | CAS-No | Volume % | Chemical Formula |
|---------------|-----------|----------|------------------|
| Oxygen | 7782-44-7 | >99 | O ₂ |



4. FIRST AID MEASURES

- **Eye Contact:** None under normal use. Get medical attention if symptoms occur
- **Skin Contact:** None under normal use. Get medical attention if symptoms occur
- **Inhalation:** Move victim to fresh air. Seek immediate medical attention/advice
- **Ingestion:** None under normal use. Get medical attention if symptoms occur
- **Notes to Physician:** Treat symptomatically

5. FIRE-FIGHTING MEASURES

Flammable Properties Oxidizer. May vigorously accelerate combustion.

Suitable Extinguishing Media Use extinguishing measures appropriate to local circumstances and the surrounding environment.

Explosion Data

- **Sensitivity to Mechanical Impact:** None
- **Sensitivity to Static Discharge:** None
- **Specific Hazards Arising from the Chemical:** May ignite combustibles (wood, paper, oil, clothing, etc.). High oxygen concentrations vigorously accelerate combustion. Cylinders may rupture under extreme heat. Continue to cool fire-exposed cylinders until flames are extinguished. Damaged cylinders should be handled only by specialists.
- **Protective Equipment and Precautions for Firefighters:** As in any fire, wear self-contained breathing apparatus pressure (SCBA)-demand, NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

- **Personal Precautions:** Ensure adequate ventilation. Monitor oxygen level.
- **Environmental Precautions** Prevent spreading of vapors through sewers, ventilation systems and confined areas.
- **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 Linde location.
- **Methods for Cleaning Up** Return cylinder to Linde India Ltd.

7. HANDLING AND STORAGE

Handling

Dry product is non-corrosive and may be used with all materials of construction. Moisture causes metal oxides which are formed with air to be hydrated so that they include volume and lose their protective role (rust formation). Concentrations of Sulphur dioxide, Chlorine, salt, etc. in the moisture enhances the rusting of metals in air. Carbon steels and low alloy steels are acceptable for use at lower pressures. For high pressure applications stainless steels are acceptable as are copper and its alloys, nickel and its alloys, brass bronze, silicon alloys, Monel[®], Inconel[®], and beryllium. Lead and silver or lead tin alloys are good gasket materials. 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.

"NO SMOKING" signs should be posted in storage and use areas. Containers of oxygen should be separated from flammable gas containers 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 1/2 hour.



Use only in ventilated areas. Never attempt to lift a cylinder by its valve protection cap. Protect cylinders from physical damage, do not drag, roll, slide or drop. When moving cylinders, even for a short distance, use a cart designed to transport cylinders. Use equipment rated for cylinder pressure. Use a backflow preventive device in the piping. Never insert an object (e.g., wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage the valve, causing the leak to occur.

Close valve after each use and when empty. If a user experiences any difficulty operating the cylinder valve discontinue use and contact the supplier.

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.

For additional recommendations consult rule number 18 & 20 of the Gas Cylinder, Rules, 2016.

Storage

Protect from physical damage. Cylinders should be stored upright with a valve protection cap in place and firmly secured to prevent falling. Store in a cool, dry, well-ventilated area of non-combustible construction away from high traffic areas and emergency exits. Keep at temperatures below 52°C / 125°F. Full and empty cylinders should be segregated. Use a "First-In-First-Out (FIFO)" inventory system to prevent full cylinders from being stored for excessive periods of time. Always store and handle compressed gas cylinders in accordance with rule number 21 of the Gas Cylinder, Rules, 2016.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

- **Exposure Guidelines** This product does not contain any hazardous materials with occupational exposure limits established by the region-specific regulatory bodies.
- **Engineering Measures** Showers. Eyewash stations. Ventilation systems.
- **Ventilation** Use local exhaust in combination with general ventilation as necessary to keep oxygen concentrations below between 20.0% to 23.5%.

Personal Protective Equipment

- **Eye/Face Protection:** Wear protective eyewear (safety glasses).
- **Skin and Body Protection:** Work gloves and safety shoes are recommended when handling cylinders. Gloves must be clean and free from grease or oil.
- **Respiratory Protection**
- **General Use:** No special protective equipment is required.
- **Emergency Use:** No special protective equipment is required.
- **Hygiene Measures:** Handle in accordance with good industrial hygiene and safety practices.

9. PHYSICAL AND CHEMICAL PROPERTIES

- **Appearance:** Colorless. **Odor** Odorless.
- **Odor Threshold:** No information available. **Physical State** Compressed gas
- **Flash Point:** No information available **Autoignition Temperature** No information available.
- **Decomposition Temperature:** No information available. **Boiling Point/Boiling Range** -182.9 °C / -297.3 °F
- **Freezing Point:** -218.8 °C / -361.8 °F **Molecular Weight** 32.00
- **Water Solubility:** Slightly soluble **Evaporation Rate** No information available



- Vapor Pressure: Above critical temp. Vapor Density 1.326 kg/m³ (0.083 lb/ft³) @21.1°C
- VOC Content (%) Not applicable. Partition Coefficient: Log P -0.65
- n-octanol/water
- Specific Vol.@21.1°C & 1 atm: 12.1 ft³/lb
- Critical Pressure: 731.4 psia
- Critical Temperature: -118.57°C / -215.4°F Flammability Limits in Air
- Upper: Not applicable
- Lower: Not applicable

10. STABILITY AND REACTIVITY

- **Stability:** Stable
- **Incompatible Products:** Combustible materials. Organic material. Reducing agents.
- **Conditions to Avoid:** Keep away from open flames, hot surfaces, combustible materials, and sources of ignition (including static discharge).
- **Hazardous Decomposition: Products** None known
- **Hazardous Polymerization:** Hazardous polymerization does not occur

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

- **LD50 Oral:** No information available
- **LD50 Dermal:** No information available
- **LC50 Inhalation:** No information available
- **Inhalation Symptoms** of overexposure are dizziness, headache, tiredness, nausea, unconsciousness, difficulty in breathing.
In dogs, poisoning symptoms began 36 hours after inhalation of pure oxygen at atmospheric pressure. Distress was seen within 48 hours and death within 60 hours.
- **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.
- **Repeated Dose Toxicity** No information available

Toxicity

- **Chronic Toxicity** Prolonged inhalation of high oxygen concentrations (>75%) may affect coordination, attention, and cause tiredness or respiratory irritation
- **Carcinogenicity** Contains no ingredient listed as a carcinogen
- **Irritation** No information available
- **Sensitization** No information available
- **Reproductive Toxicity** No information available
- **Developmental Toxicity** No information available
- **Synergistic Materials** None known
- **Target Organ Effects** None known

12. ECOLOGICAL INFORMATION

Ecotoxicity

Will not bioconcentrate

13. DISPOSAL CONSIDERATIONS



Waste Disposal Methods 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 Linde India Ltd for proper disposal.

14. 14. TRANSPORT INFORMATION

DOT

Proper shipping name: Oxygen, compressed

Hazard Class: 2.2

Subsidiary Class: 5.1

UN-Number: UN1072

Description: UN1072, Oxygen, compressed, 2.2, (5.1)

ADR

Proper Shipping Name: Oxygen, compressed

Hazard Class: 2.2

UN-Number: UN1072

Classification Code: 10

Description: UN107,2 Oxygen, compressed, 2.2

ADR/RID-Labels 5.1

15. REGULATORY INFORMATION

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

Acute Health Hazard: No

Chronic Health Hazard: No

Fire Hazard: Yes

Sudden Release of Pressure Hazard: Yes

Reactive Hazard: No

16. OTHER INFORMATION



- **General:** Ensure all national/ local regulations are observed.
- **Document Information:** In preparing this document help has been taken from MSDS for Linde (US)

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