Ellenbarrie Industrial Gases Limited Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name:	Oxygen	**Trade Name:**	Oxygen.
Product Use:	Many.		
Chemical Name:	Oxygen.	**Synonym:**	NA.
Chemical Formula:	O_2	**Chemical Family:**	Permanent Gas.
Telephone:	**Emergencies:** *033-25828791, *033-27094398	**Supplier /Manufacture:**	Ellenbarrie Industrial Gases Limited, 3A, Ripon Street, Kolkata-700016
	*08924-205105	**Phone:**	033-22292441, 22291923, 22491922
		Fax:	033-22493396

**Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Ellenbarrie Industrial Gases Limited sales representative.*

2. Composition and Information on Ingredients

INGREDIENTS	% (VOL)	CAS NUMBER	LD_{50} (Species & Routes)	LC_{50} (Rat, 4 hrs.)	TLV-TWA (ACGIH)
Oxygen	100	7782-44-7	Not applicable.	Not applicable.	None.

3. Hazards Identification

Emergency Overview

WARNING! High pressure, oxidizing gas. Vigorously accelerates combustion. Self-contained breathing apparatus may be required by rescue workers.

ROUTES OF EXPOSURE: Inhalation.

THRESHOLD LIMIT VALUE: TLV-TWA Data from 2004 Guide to Occupational Exposure Values (ACGIH).

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION: Breathing 80% 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 also central nervous system effects resulting in dizziness, poor coordination, tingling sensation, visual and hearing disturbances, muscular twitching, unconsciousness and convulsions. Breathing of Oxygen under pressure may cause prolongation of adaptation to darkness and reduced peripheral vision.

SKIN CONTACT: No harm expected.

SKIN ABSORPTION: No evidence of adverse effects from available information.

SWALLOWING: This product is a gas at normal temperature and pressure.

EYE CONTACT: No evidence of adverse effects from available information.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No evidence of adverse effects from available information.

OTHER EFFECTS OF OVEREXPOSURE: See "Notes to Physician", in the "First Aid" section.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: See "Notes to Physician", in the "First Aid" section.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:

None currently known.

CARCINOGENICITY:

Not listed as carcinogen by OSHA, NTP or IARC.

4. First Aid Measures

INHALATION:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. Keep patient warm and at rest. Get medical attention. Advise the physician that the victim has been exposed to high concentration of Oxygen.

SKIN CONTACT:

No harm expected.

SWALLOWING:

This product is a gas at normal temperature and pressure.

EYE CONTACT:

No harm expected.

NOTES TO PHYSICIAN:

Supportive treatment should include immediate sedation, anti-convulsive therapy if needed, and rest. Animal studies suggest that the administration of certain drugs, including phenothiazine drugs and chloroquine, increase the susceptibility to toxicity from Oxygen at high concentrations or pressures. Animal studies also indicate that vitamin E deficiency may increase susceptibility to Oxygen toxicity. Airway obstruction during high Oxygen tension may cause alveolar collapse following absorption of the Oxygen. Similarly, occlusion of the eustachian tubes may cause retraction of the eardrum and obstruction of the Para-nasal sinuses may produce “vacuum-type” headache. Newborn premature infants exposed to high Oxygen concentrations may suffer delayed retinal damage, which can progress, to retinal detachment and blindness (retrolental fibroplasia). Retinal damage can also occur in adults exposed to 100% Oxygen under greater that atmospheric pressure, particularly in individuals whose retinal circulation has been previously compromised.

All individuals exposed for only periods to Oxygen at high pressure and all that exhibit overt Oxygen toxicity should have ophthalmologic examination.

5. Fire Fighting Measures

FLAMMABLE: No. **IF YES, UNDER WHAT CONDITIONS?** Vigorously accelerates combustion.

FLASH POINT (Test method) Not applicable. **AUTOIGNITION TEMPERATURE** Not applicable.

FLAMMABLE LIMITS IN AIR, % by volume: **LOWER:** Not applicable. **UPPER:** Not applicable.

EXTINGUISHING MEDIA:

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

SPECIAL FIRE FIGHTING PROCEDURES:

WARNING! Evacuate all personnel from danger area. Immediately deluge cylinders with water from maximum distance until cool; then move them away from fire area if without risk.

HAZARDOUS COMBUSTION PRODUCTS:

None.

SENSITIVITY TO IMPACT:

Avoid impact against container.

UNUSUAL FIRE AND EXPLOSION HAZARD:

Oxidizing agent. Vigorously accelerates combustion. Contact with flammable materials may cause fire or explosion. Container may rupture due to heat of fire. Vapours are extremely irritating. Contact may cause burns to skin and eyes. No part of a container should be subjected to a temperature higher than 52°C. See incompatibility in Section 10. Most containers are provided with a pressure relief device designed to vent contents when they are exposed to elevated temperature. Smoking, flames and electric sparks in the presence of enriched Oxygen atmospheres are potential explosion hazards.

SENSITIVITY TO STATIC DISCHARGE:

Not applicable.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

WARNING! Shut off flow if you can do so without risk. Ventilate area or move cylinder to a well-ventilated area. Remove all flammable materials from vicinity. Oxygen must never be permitted to strike an oily surface, greasy clothes, or other combustible material.

WASTE DISPOSAL METHOD:

Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, provincial, and local regulations. If necessary call your local supplier.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN STORAGE:

Store and use with adequate ventilation. Separate flammable cylinders from Oxygen, chlorine, and other oxidizers by at least 6 m or use a barricade of non-combustible material. This barricade should be at least 1.5 m high and have a fire resistance rating of at least ½ hour. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Post “No Smoking or Open Flames” signs in storage and use areas. There must be no sources of ignition. All electrical equipment in storage areas must be explosion-proof. Storage areas must meet national electric codes for Class 1 hazardous areas. Store only where temperature will not exceed 52°C. Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods. See section 16.

PRECAUTIONS TO BE TAKEN IN HANDLING:

Use piping and equipment adequately designed to withstand pressures to be encountered. Ground all equipment. Store and use with adequate ventilation at all times. Use only in a closed system constructed of corrosion resistant materials. NOTE: Reverse flow into cylinder may cause rupture. Use a check valve or other protective apparatus in any lines or piping from the cylinder to prevent reverse flow. (See section 16 for more details).

WHEN USED IN WELDING AND CUTTING: Read and understand the manufacturer’s instructions and the precautionary label on the product on which welding is due to be carried out. See American Standard Z49.1 "Safety in Welding and Cutting" published by the American Welding Society.

Note: Suitability for use 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. Become familiar with the effects, methods, frequency and duration of use, hazards, side effects and precautions to be taken.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE:

High-pressure, oxidizing gas!!! Use piping and equipment adequately designed to withstand pressures to be encountered. Vigorously accelerates combustion. Keep oil, grease, and combustibles away. Store and use with adequate ventilation at all times. Close valve after each use; keep closed even when empty. Prevent reverse flow. Reverse flow into cylinder may cause rupture. Use a check valve or other protective device in any line or piping from the cylinder. When returning cylinder to supplier, be sure valve is closed, then install valve outlet plug tightly. Never work on a pressurized system. If there is a leak, close the cylinder valve. Vent the system down in a safe and environmentally sound manner in compliance with all federal, provincial, and local laws; then repair the leak. Never place a compressed gas cylinder where it may become part of an electrical circuit.

8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST: Use a local exhaust system, if necessary, to prevent increased Oxygen concentration and, in welding, to keep hazardous fumes and gases below applicable TLVs in the worker's breathing zone.

MECHANICAL (general): General exhaust ventilation may be acceptable if it can maintain a supply of air that is not too rich in Oxygen and, during welding, can keep hazardous fumes and gases below the applicable TLVs in the worker's breathing zone.

SPECIAL: None.

OTHER: None.

PERSONAL PROTECTION:

RESPIRATORY PROTECTION: None required under normal use. However, air-supplied respirators are required while working in confined spaces with this product. For welding, use air-purifying or air-supplied respirators, as appropriate, where local or general exhaust ventilation is inadequate. Adequate ventilation must keep worker exposure below applicable TLVs for fumes, gases and other by-products of welding with Oxygen. Selection should be based on the current CSA standard Z94.4 “Selection, Care, and Use of Respirators”. Respirators should be approved by NIOSH and MSHA.

SKIN PROTECTION: Wear work gloves when handling cylinders.

EYE PROTECTION: Wear safety glasses when handling cylinders. Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. Protective clothing where needed. Cuff less trousers should be worn outside the shoes. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines.

9. Physical and Chemical Properties

PHYSICAL STATE:	Gas.	FREEZING POINT:	-218.78°C (-361.8°F)	pH:	Not applicable.
BOILING POINT	-182.96°C (-297.3°F)	VAPOUR PRESSURE	Not applicable.	MOLECULAR WEIGHT:	32 g/mole
SPECIFIC GRAVITY: LIQUID (Water = 1)	Not applicable.	SOLUBILITY IN WATER,	Negligible.		
SPECIFIC GRAVITY: VAPOUR (Air = 1)	1.105 @ 25°C	EVAPORATION RATE (Butyl Acetate=1):	Not applicable.	COEFFICIENT OF WATER/OIL DISTRIBUTION:	Not applicable.
VAPOUR DENSITY:	0.0013 g/ml @ 21.1°C	% VOLATILES BY VOLUME:	100% (v/v).	ODOUR THRESHOLD:	Odourless.
APPEARANCE & ODOUR:	Colourless.	Odourless.			

10. Stability and Reactivity

STABILITY:	The product is stable.
CONDITIONS OF CHEMICAL INSTABILITY:	Compatibility with plastics should be confirmed prior to use.
INCOMPATIBILITY (materials to avoid):	Combustible materials, asphalt, flammable materials, especially oils and greases. Oxygen reacts with many materials.
HAZARDOUS DECOMPOSITION PRODUCTS:	None.
HAZARDOUS POLYMERIZATION:	Will not occur.
CONDITIONS OF REACTIVITY:	None known.

11. Toxicological Information

See section 3.

At atmospheric concentration and pressure, Oxygen poses no toxicity hazards. At high concentrations, newborn premature infants may suffer delayed retinal damage (retrolental fibroplasia) that can progress to retinal detachment and blindness. Retinal damage may also occur in adults exposed to 100% Oxygen for extended periods (24 to 48 hours) or at greater than atmospheric pressure, particularly in individuals whose retinal circulation has been previously compromised. All individuals exposed for long periods to Oxygen at high pressure and all who exhibit overt Oxygen toxicity should have ophthalmologic examinations.

At two or more atmospheres, toxicity to the Central Nervous System (CNS) occurs. Symptoms include nausea, vomiting, dizziness or vertigo, muscle twitching, vision changes, and loss of consciousness and generalized seizures. At three atmospheres, CNS toxicity occurs in less than two hours; at six atmospheres, in only a few minutes.

Patients with chronic obstructive pulmonary disease retain carbon dioxide abnormally. If Oxygen is administered, raising their blood Oxygen concentration, their breathing becomes depressed and retained carbon dioxide rises to a dangerous level.

Animal studies suggest that the administration of certain drugs, including Phenothiazine drugs and Chloroquine, increases the susceptibility to toxicity from Oxygen at high concentrations or pressures. Animal studies also indicate that vitamin E deficiency may increase susceptibility to Oxygen toxicity.

Airway obstruction during high Oxygen tension may cause alveolar collapse following absorption of the Oxygen. Similarly, occlusion of the eustachian tubes may cause retraction of the eardrum and obstruction of the Para-nasal sinuses may produce vacuum-type headache.

12. Ecological Information

No adverse ecological effects expected. This product does not contain any Class I or Class II ozone-depleting chemicals. The components of this mixture are not listed as marine pollutants by TDG Regulations.

13. Disposal Considerations

WASTE DISPOSAL METHOD:	Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

14. Transport Information

TDG/IMO SHIPPING NAME: Oxygen, Compressed

HAZARD CLASS: CLASS: 2.2

IDENTIFICATION #: UN1072

Non-flammable, non-corrosive and non-poisonous gas.
CLASS 5.1: Oxidizing material.

SHIPPING LABEL(s): Special/Oxidizer with Class 2 at bottom.

PLACARD (when required): Special/Oxidizer with Class 2 at bottom.

SPECIAL SHIPPING INFORMATION:

Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, non-ventilated compartment of vehicle can present serious safety hazards.

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, provincial, and local regulations.

WHMIS (Canada) CLASS A: Compressed gas.
CLASS C: Oxidizing material.

International Regulations

EINECS Not available.

DSCL (EEC) R8- Contact with combustible material may cause fire.

International Lists No products were found.

16. Other Information

MIXTURES:

When two or more gases or liquefied gases are mixed, their hazardous properties may combine to 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 make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

HAZARD RATING SYSTEM:

HMIS RATINGS:

HEALTH	**0**
FLAMMABILITY	**0**
PHYSICAL HAZARD	**3**

Connections: **DO NOT USE ADAPTERS.** Use the proper connections. Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compress gas cylinder which has not been filled by the owner or with/her written consent is a violation of transportation regulations.

Disclaimer: The opinions expressed herein are those of qualified experts within Ellenbarrie Industrial Gases Limited. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Ellenbarrie Industrial Gases Limited, it is the user's obligation to determine the conditions of safe use of the product.

Ellenbarrie Industrial Gases Limited requests the users of this product to study this Material Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety information, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

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