

MATERIAL SAFETY DATA SHEET (MSDS)

OXYGEN

DATE: July 2013
Ref. No.: MS027

Version : 3

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1 PRODUCT AND COMPANY IDENTIFICATION

Product Name	OXYGEN
Chemical Formula	O ₂
Trade Names	Oxygen, Compressed Oxygen, Instrument Grade (N2.5) Oxygen, EP Grade (N2.7) Oxygen, IG Zero (N4.5) Oxygen, UHP (N4.5) Medical Oxygen Oxygen Agrigas Oxygen Econopack Oxygen Portapak
Colour coding	Compressed, IG, EP, IG Zero & UHP cylinders all have black bodies. Relevant decals or stencilling depict actual grades. Medical Oxygen Black Body with a white shoulder Oxygen AgriGas Black body with an orange valve guard Oxygen Econopack Black body with a blue valve guard
Valve	Compressed, IG, EP, IG Zero & Medical grades have 3 SO- Brass, 5/8 inch BSP right hand female valves. Medical oxygen cylinders could also have the revenant Pin Index valves fitted. UHP grade has the Neriki-Brass 5/8 inch BSP right hand female valve fitted.

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2 COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Oxygen
Chemical Family	Oxidant
CAS No	7782-44-7
UN No	1072
ERG No	122
Hazchem Warning	5 A Non-flammable Gas

3 HAZARDS IDENTIFICATION

Main Hazards

All cylinders are transportable gas containers. Oxygen is non-flammable, but readily supports combustion. Never permit oil, grease or other readily combustible substance to come into contact with high concentrations of Oxygen.

Adverse Health Effects

Central nervous system toxicity including dizziness, convulsions and loss of consciousness can occur after only 2-3 hours of exposure to pure oxygen at 2 or more atmospheres. Retrosternal soreness, associated with coughing and breathing difficulties, made worse by smoking and exposure to cold air can occur after breathing pure oxygen at atmospheric pressure for several hours.

Chemical Hazards

Oxygen is non-flammable, but strongly supports combustion (including some materials which do not normally burn in air). Since dry Oxygen is non-corrosive, most materials of construction are suitable. Avoid all flammable materials.

Biological Hazards

No known effect.

Vapour Inhalation

Pure oxygen is a local irritant to mucous membranes and, with extended continued exposure, can be destructive to lung tissue.

4 FIRST AID MEASURES

Eye/Skin Contact	No known effect.
Ingestion	(See Section 3 above)
Inhalation	

Prompt medical attention is mandatory in all cases of overexposure to Oxygen. Rescue personnel should be cognisant of extreme fire hazard associated with oxygen-rich atmospheres. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. They should be kept warm and quiet. Quick removal from the contaminated area is most important. The physician should be informed that the patient has experienced hyperoxia.

5 FIRE FIGHTING MEASURES

Extinguishing Media

As Oxygen is non-flammable, but strongly supports combustion; the correct type of extinguishing should be used depending on the combustible material involved.

Specific Hazards

Oxygen vigorously accelerates combustion. Materials that would not normally burn in air could combust vigorously in atmospheres having high concentrations of Oxygen.

Emergency Actions

If possible, shut off the source of escaping Oxygen. Evacuate area. All cylinders should be removed from the vicinity of the fire. Cylinders that cannot be removed should be cooled with water from a safe distance. Cylinders which have been exposed to excessive heat should be clearly identified and returned to supplier.

CONTACT THE NEAREST AFROX BRANCH.

Protective Clothing

Safety goggles, gloves and safety shoes should be worn when handling cylinders.

Environmental Precautions

As the gas is heavier than air, pockets of Oxygen-enriched air could occur. These could lead to the fire spreading rapidly. If possible, ventilate the affected area.

6 ACCIDENTAL RELEASE

MEASURES Personal Precautions

Although Oxygen is not itself combustible, it supports and accelerates combustion. Clothes and other materials, not normally considered flammable, will burn fiercely in the presence of Oxygen, and can be set alight by a single spark, or even hot cigarette ash.

Environmental Precautions

Oxygen does not pose a hazard to the environment. Beware of Oxygen-enriched atmospheres coming into contact with readily combustible materials. If possible, ventilate the affected area.

Small Spills

Shut off the source of excess Oxygen. Ventilate the area.

Large Spills

Evacuate the area. Shut off the source of the spill if this can be done without risk. Ventilate the area using forced-draught if necessary.

7 HANDLING AND STORAGE

Do not allow cylinders to slide or come into contact with sharp edges. Cylinders of Oxygen should not be stored near cylinders of acetylene or other combustible gases. Oxygen cylinders may be stacked horizontally provided that they are firmly secured at each end to prevent rolling. Prevent dirt, grit of any sort, oil or any other lubricant from entering the cylinder valves, and store cylinders well clear of any corrosive influence, e.g. battery acid. Compliance with all relevant legislation is essential. Use a "first in - first out" inventory system to prevent full cylinders from being stored for excessive periods of time. Keep out of reach of children.

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8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Hazards

Avoid exposure to oxygen-enriched atmospheres, as this could result in clothing becoming saturated by oxygen. On ignition the clothing could burn fiercely resulting in serious burns.

Engineering Control Measures

Engineering control measures are preferred to reduce exposure to Oxygen-enriched atmospheres. General methods include forced-draught ventilation, separate from other exhaust ventilation systems. Ensure that sufficient fresh air enters at, or near, floor level.

Personal Protection

Safety goggles, gloves and shoes should be worn when handling cylinders.

Skin

No known effect.

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DATA

Chemical Symbol	O ₂
Molecular Weight	32,00
Specific Volume @ 20°C & 101,325 kPa	755 ml/g
Boiling Point 101,325 kPa	90.18 °K; -183 °C; 181.4 °F
Density, gas @ 101,325 kPa and 20°C	1,33 kg/m ³
Relative density (Air = 1) @ 101,325 kPa	1,053
Solubility in Water @ 101.325 kPa @ 25 °C	
(Partial Pressure of O ₂) @ 0 °C	4.889 cm ³ O ₂ /100 cm ³ water
Colour	None
Taste	None
Odour	None

10 STABILITY AND REACTIVITY

Conditions to avoid

The build-up of Oxygen-enriched atmospheres as, depending on temperature, oxygen reacts with all of the elements, excepting the inert gases, to form oxides. These reactions can sometimes be violent, as with highly combustible materials such as oil and grease. Never use cylinders as rollers or supports, or for any other purpose than the storage of Oxygen. Never expose cylinders to excessive heat, as this may cause sufficient build-up of pressure to rupture the cylinders.

Incompatible Materials

Since dry Oxygen is non-corrosive, most materials of construction are suitable. Avoid all flammable materials. (For further information see Section 3, Chemical Hazards).

Hazardous Decomposition Products

None

11 TOXICOLOGICAL INFORMATION

Acute Toxicity Skin & eye contact	No known effect
Chronic Toxicity	No known effect
Carcinogenicity	No known effect
Mutagenicity	No known effect
Reproductive Hazards	No known effect

(For further information see Section 3. Adverse Health effects)

12 ECOLOGICAL INFORMATION

Oxygen is heavier than air and care should be taken to avoid the formation of Oxygen-enriched pockets. It does not pose a hazard to the ecology.

13 DISPOSAL CONSIDERATIONS Disposal Methods

Small amounts may be blown to atmosphere under controlled conditions. Large amounts should only be handled by gas supplier.

Disposal of Packaging

The disposal of containers must only be handled by the gas supplier.

14 TRANSPORT INFORMATION

ROAD TRANSPORTATION

UN No	ERG No	1072
Hazchem warning		122
		5A Non-flammable Gas



SEA TRANSPORTATION

IMDG Class	1072
Packaging group Label	Non-flammable Gas

AIR TRANSPORTATION

ICAO/IATA Code	1072
Class	Non-flammable
Packaging group	2.2
Packaging instructions	
- Cargo	200
- Passenger Maximum quantity allowed	200
- Cargo	100kg
- Passenger	75kg

15 REGULATORY INFORMATION

EEC Hazard class	Non-flammable
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Risk Phrase	Description	Safety Phrase	Description
R8	Contact with combustible material may cause fire	S1	Keep locked
		S2	Keep out of reach of Children
		S17	Keep away from combustible material

National legislation None

Refer to SABS 0265 for explanation of the above.

16 OTHER INFORMATION Bibliography

Compressed Gas Association, Arlington, Virginia
Handbook of Compressed Gases - 3rd Edition
Matheson. Matheson Gas Data Book - 6th Edition
SABS 0265 - Labelling of Dangerous Substances

17 EXCLUSION OF LIABILITY

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