OXYGEN, FRESHLINE ™

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identifier : FRESHLINE ™ OXYGEN

CAS No. : 7782-44-7

Chemical formula : O2

Synonyms : Oxygen, Oxygen gas, Gaseous Oxygen, GOX

REACH Registration Number : Listed in Annex IV/V REACH, exempted from registration.

Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Food Applications/ Industries and Professional use. Perform risk assessment prior to use.

Restrictions on use : No data available

Details of the supplier of the safety data sheet

Physical address : Air Products South Africa (Pty) Ltd.
Silver Stream Business Park, 1st Floor, Building 3,
10 Muswell Road South,
Bryanston, 2191

Telephone : +27 (0)11 570 5000 (Head Office)
+27 (0)11 977 6444 (Customer Care Cylinders)
0800 023 298 (Engineering / Bulk Services)

Emergency telephone number (24h) : 0800 650 315

SECTION 2: HAZARDS IDENTIFICATION

Classification of the substance/mixture

Oxidizing gases - Category 1 H270: May cause or intensify fire; oxidiser

Gases under pressure - Compressed gas, H280: Contains gas under pressure, may explode if heated

Label elements

Hazard pictograms/symbols

Signal word : Danger

Hazard statements:

H270: May cause or intensify fire; oxidiser

H280: Contains gas under pressure; may explode if heated.

Precautionary statement

Prevention : P220: Keep away from clothing and other combustible materials

P244: Keep valves and fittings free from oil and grease.

Response : P370+P376: In case of fire: Stop leak if safe to do so.

Storage : P403: Store in a well-ventilated place.

Other hazards

High pressure, oxidizing gas.

Vigorously accelerates combustion.

Keep oil, grease, and combustibles away.

May react violently with combustible materials.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Substances

Components	EINECS/ELINCS Number	CAS Number	Concentration (volume)
Oxygen	231-956-9	7782-44-7	100%

Components	Classification (CLP)	REACH Reg. #
Oxygen	Ox. Gas 1 ; H270 Press. Gas (comp.) H280	*1

*1: Listed in Annex IV/V REACH, exempted from registration

*2: Registration not required: Substance manufactured or imported< 1 t/y.

*3: Registration not required: substance manufactured or imported < 1 t/y for non-intermediate uses.

Refer to section 16 for full text of each relevant hazard statement (H)

Concentration is nominal. For the exact product composition, please refer to Air products specifications.

Mixtures : Not applicable

SECTION 4: FIRST AID MEASURES

Description of first aid measures

General advice : Move victim to uncontaminated area wearing self-contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

Eye contact : IF exposed or concerned: Seek medical advice/attention.

Skin contact : Adverse effects not expected from this product. IF exposed or concerned: Seek medical advice/attention.

Ingestion : Ingestion is not considered a potential route of exposure.

Inhalation : Consult a physician after significant exposure. Move to fresh air. If breathing has stopped or is laboured, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately.

Most important symptoms and effects, both acute and delayed

Symptoms : No data available

Indication of any immediate medical attention and special treatment needed

Treatment : If exposed or concern: get medical attention/advice.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media : The product itself does not burn. Use extinguishing media appropriate for surrounding fire.

Extinguishing media which must not be used for safety reasons : Do not use water jet to extinguish.

Special hazards arising from the substance or mixture

Upon exposure to intense heat or flame, cylinder will vent rapidly and or rupture violently. Oxidant. Strongly supports combustion. May react violently with combustible materials. Some materials which are non-combustible in air may burn in the presence of an oxidizer. Move away from container and cool with water from a protected position. Keep adjacent cylinders cool by spraying with large amounts of water until the fire burns itself out. If possible, stop flow of product.

Advice for fire-fighters : Wear self-contained breathing apparatus for fire-fighting if necessary. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire-fighters. Standard EN 137 – Self-contained open-circuit compressed air breathing apparatus with full face mask. Standard EN 469 – Protective clothing for fire-fighters. Standard EN 659 – Protective gloves for fire-fighters.

Further information : Some materials that are non-combustible in air will burn in the presence of an oxygen enriched atmosphere (greater than 23.5%). Fire resistant clothing may burn and offer no protection in oxygen rich atmospheres.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Clothing exposed to high concentrations may retain oxygen 30 minutes or longer and become a potential fire hazard. Stay away from ignition sources. Evacuate personnel to safe areas. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ventilate the area.

Environmental precautions : Do not discharge into any place where its accumulation could be dangerous. Prevent further leakage or spillage if safe to do so.

Methods and materials for containment and cleaning up : Ventilate the area.

Additional advice : If possible, stop flow of product. Increase ventilation to the release area and monitor concentrations. If leak is from cylinder or cylinder valve, call the Air Products emergency telephone number. If the leak is in the user's system, close the cylinder valve, safely vent the pressure, and purge with an inert gas before attempting repairs.

Reference to other sections : For more information refer to Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Cylinders should be stored up right with valve protection guard in place and firmly secured to prevent falling or being knocked over. Use equipment rated for cylinder pressure. All gauges, valves, regulators, piping and equipment to be used in oxygen service must be cleaned for oxygen service. Oxygen is not to be used as a substitute for compressed air. Never use an oxygen jet for cleaning purposes of any sort, especially clothing, as it increases the likelihood of an engulfing fire. Only experienced and properly instructed persons should handle compressed gases/cryogenic liquids. Protect cylinders from physical damage; do not drag, roll, slide or drop. Do not allow storage area temperature to exceed 50°C. Before using the product, determine its identity by reading the label. Know and understand the properties and hazards of the product before use. When doubt exists as to the correct handling procedure for a particular gas, contact the supplier. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Do not remove valve guards. Before connecting the container, check the complete gas system for suitability, particularly for pressure rating and materials. Before connecting the container for use, ensure that back feed from the system into the container is prevented. Ensure the complete gas system is compatible for pressure rating and materials of construction. Ensure the complete gas system has been checked for leaks before use. Employ suitable pressure regulating devices on all containers when the gas is being emitted to systems with lower pressure rating than that of the container. Never insert an object (e.g., spanner/wrench, screwdriver, pry bar, etc.) into the valve openings. Doing so may damage valve, causing a leak to occur.

If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Do not use containers as rollers or supports or for any other purpose than to contain the gas as supplied. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit. Do not smoke while handling product or cylinders. Never recompress a gas or a gas mixture without first consulting the supplier. Never attempt to transfer gases from one cylinder/container to another. Always use backflow protective device in piping. Never permit oil, grease, or other readily combustible substances to come into contact with valves or containers containing oxygen or other oxidants. Do not use rapidly opening valves (e.g. ball valves). Open valve slowly to avoid pressure shock. Never pressurize the entire system at once. Use only with equipment cleaned for oxygen service and rated for cylinder pressure. Never use direct flame or electrical heating devices to raise the pressure of a container. Containers should not be subjected to temperatures above 50°C. Prolonged periods of cold temperature below -30°C should be avoided.

Conditions for safe storage, including any incompatibilities

Containers should be stored in a purpose built compound which should be well ventilated, preferably in the open air. Full containers should be stored so that oldest stock is used first. Stored containers should be periodically checked for general condition and leakage.

Observe all regulations and local requirements regarding storage of containers. Protect containers stored in the open against rusting and extremes of weather. Containers should not be stored in conditions likely to encourage corrosion. Containers should be stored in the vertical position and properly secured to prevent toppling. The container valves should be tightly closed and where appropriate valve outlets should be capped or plugged. Container valve guards or caps should be in place. Keep containers tightly closed in a cool, well-ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Full and empty cylinders should be segregated. Do not allow storage temperature to exceed 50°C. Display "No Smoking or Open Flames" signs in the storage areas. Return empty containers in a timely manner.

Technical measures/Precautions

Containers should be segregated in the storage area according to the various categories (e.g. flammable, toxic, etc.) and in accordance with local regulations.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure controls

Engineering measures

Ensure adequate ventilation.

Personal protective equipment

Respiratory protection	:	Not required under normal use. Self-contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmosphere. Users of breathing apparatus must be trained.
Hand protection	:	Wear sturdy work gloves when handling cylinders. Gloves must be clean and free of oil and grease. Standard EN 388 – Protective gloves against mechanical risk. The breakthrough time of the selected glove(s) must be greater than the intended use period.
Eye/face protection	:	Safety glasses recommended when handling cylinders. Standard EN 166 – Personal eye-protection.
Skin and body protection	:	Safety shoes are recommended when handling cylinders. Standard EN ISO 20345 – Personal protective equipment, Safety footwear.
Special instructions for protection and hygiene:		Ensure adequate ventilation, especially in confined areas. Gloves must be clean and free of oil and grease.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Form	:	Compressed gas.
Colour	:	Colourless gas
Odour	:	No odour warning properties.
Molecular Weight	:	32 g/mol
Relative vapour density	:	1.1 (air = 1) Heavier than air
Relative density	:	1.1 (water = 1)
Vapour pressure	:	Not applicable.
Density	:	0.0013 g/cm^3 at 21 °C Note: (as vapour)
Specific Volume	:	0.7540 m^3/kg at 21 °C
Boiling point/range	:	-183 °C
Critical temperature	:	-118 °C
Melting point/range	:	-219 °C
Auto-ignition temperature	:	Non flammable
Water solubility	:	0.039 g/l
Partition coefficient n-octanol/ water [log kow]	:	Not applicable
pH	:	Not applicable
Viscosity	:	No reliable data available.
Particle characteristics	:	Not applicable
Upper and lower explosion/flammability limits	:	Non flammable
Flash point	:	Not applicable
Decomposition temperature	:	Not applicable

Other information

Explosive properties	:	Not applicable
Oxidizing properties	:	Ci = 1
Odour threshold	:	Odour threshold is subjective and inadequate to warn of overexposure
Evaporation rate	:	Not applicable
Flammability (solid/gas)	:	Refer to product classification in section 2

SECTION 10: STABILITY AND REACTIVITY

Reactivity	:	No reactivity hazard other than the effects described in sub-sections below.
Chemical Stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Violently oxidises organic material.
Conditions to avoid	:	None under recommended storage and handling conditions (see section 7)
Incompatible Materials	:	Flammable materials. Organic materials. Avoid oil, grease and all other combustible materials.
Hazardous decomposition products	:	No data available

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects

Likely routes of exposure

Effects on Eye	:	In case of direct contact with eyes, seek medical advice
Effects on Skin	:	Adverse effects not expected from this product
Inhalation Effects	:	Breathing 75% 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 pure oxygen under pressure may cause lung damage and also central nervous system effects.
Ingestion Effects	:	Ingestion is not considered a potential route of exposure.
Symptoms	:	No data available
Aggravated Medical	:	If oxygen is administered to persons with chronic obstructive pulmonary disease, raising the oxygen concentration in the blood depresses their breathing and raises their retained carbon dioxide to a dangerous level.

Acute toxicity

Acute oral toxicity	:	No data available on the product itself
Acute inhalation toxicity	:	No data available on the product itself
Acute dermal toxicity	:	No data available on the product itself
Skin corrosion/irritation	:	No data available
Serious eye damage/eye irritation	:	No data available
Sensitization	:	No data available

Chronic toxicity or effects from long term exposure

Carcinogenicity : No data available

Reproductive toxicity : No data available

Germ cell mutagenicity : No data available on the product itself

Specific target organ systemic toxicity (single exposure) : No data available

Specific target organ systemic toxicity (repeated exposure)

Premature infants exposed to high oxygen concentrations may suffer delayed retinal damage 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 hr). At two or more atmospheres central nervous system (CNS) toxicity 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 and at six atmospheres in only a few minutes.

Aspiration hazard : No data available

SECTION 12: ECOLOGICAL INFORMATION

Toxicity

Aquatic toxicity : No data is available on the product itself.

Toxicity to other organisms : No data is available on the product itself.

Persistence and degradability

No data available.

Bioaccumulative potential : Refer to section 9 “partition Coefficient (n-octanol/water)”

Mobility in soil : Because of its high volatility, product is unlikely to cause ground pollution.

Other adverse effects

No ecological damage caused by this product.

Effect on the ozone layer : No known effects from this product.

Ozone Depleting Potential : None

Effect on global warming : No known effects from this product.

Global Warming Potential : None

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods : Return unused product in original cylinder to supplier. Contact supplier if guidance is required.

Contaminated packaging : Return cylinder to supplier.

SECTION 14: TRANSPORT INFORMATION

ADR

UN/ID No.	:	UN1072
Proper shipping name	:	OXYGEN, COMPRESSED
Class or Division	:	2
Tunnel Code	:	(E)
Label(s)	:	2.2 (5.1)
ADR/RID Hazard ID no.	:	25
Marine Pollutant	:	No

IATA

UN/ID No.	:	UN1072
Proper shipping name	:	Oxygen, compressed
Class or Division	:	2.2
Label(s)	:	2.2 (5.1)
Marine Pollutant	:	No

IMDG

UN/ID No.	:	UN1072
Proper shipping name	:	OXYGEN, COMPRESSED
Class	:	2.2
Label(s)	:	2.2 (5.1)
Marine Pollutant	:	No
Segregation Group	:	None

RID

UN/ID No.	:	UN1072
Proper shipping name	:	OXYGEN, COMPRESSED
Class	:	2
Label(s)	:	2.2 (5.1)
Marine Pollutant	:	No

Further Information

Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Ensure compliance with applicable regulations.

Before transporting product containers ensure that they are firmly secured, and cylinder valve is closed and not leaking, valve outlet cap nut or plug (where provided) is correctly fitted and valve protection device (where provided) is correctly fitted.

The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact an Air Products customer service representative.

SECTION 15: REGULATORY INFORMATION

OHS Act	:	Occupational Health and Safety Act 85 of 1993 (and Regulations)
SANS 11014	:	Safety data sheet for chemical products- Content and order of sections
SANS 10234	:	Globally Harmonized System of classification and labelling of chemicals (GHS)
SANS 10265	:	The classification and labelling of dangerous substances and preparations for sale and handling
SANS 10019	:	Transportable containers for compressed, dissolved and liquefied gases – Basic design, manufacture, use and maintenance
SANS 1518	:	Transport of dangerous goods – Design, construction, testing, approval and maintenance of road vehicles and portable tanks
SANS 10228	:	The identification and classification of dangerous goods for transport
SANS 10229-1&2	:	Transport of dangerous goods – Packaging and large packaging for road and rail transport Part 1: Packaging / Part 2: Large Packaging
SANS 10263-2	:	The warehousing of dangerous goods Part 2: The storage and handling of gas cylinders

NB: Refer to latest edition

SECTION 16: OTHER INFORMATION

Ensure all national/local regulations are observed.

Hazard Statements

H270: May cause or intensify fire; oxidiser

H280: Contains gas under pressure; may explode if heated.

Indication of Method

Oxidizing gases Category 1. May cause or intensify fire, oxidiser.

Gases under pressure. Compressed gas. Contains gas under pressure; may explode if heated.

Abbreviations and acronyms

ATE – Acute Toxicity Estimate

CLP – Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008

REACH – Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006

EINECS – European Inventory of Existing Commercial Chemical Substances

ELINCS – European List of Notified Chemical Substances

CAS# - Chemical Abstract Service number

PPE – Personal Protective Clothing

Kow – octanol-water partition coefficient

LC50- Lethal Concentration to 50% of a test population

LD50 – Lethal Dose to 50% of a test population (Median Lethal Dose)

OEL – Occupational Exposure Limit

PBT – Persistent Bioaccummulative and Toxic

vPvB - Very Persistent and Very Bioaccummulative

STOT – Specific Target Organ Toxicity

EN – European Standard

UN – United Nations

ADR – European Agreement concerning the International Carriage of Dangerous Goods by Road

IATA – International Air Transport Association

IMDG – International Maritime Dangerous Goods

RID – Regulations concerning the International Carriage of Dangerous Goods by Rail

Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

(Reference www.airproducts.com:- Air Products PLC Freshline OXYGEN MSDS Number 300000079833 / Version 1.2 / Revision Date 24.03.2020)