Safety Data Sheet

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SECTION 1: Identification of the substance/mixture and of the company undertaking

1.1 Product identifier: Oxygen

CAS number: 7782-44-7

Chemical formula: O2

Synonyms: Oxygen, Oxygen gas, Gaseous Oxygen, GOX

REACH Registration no: Listed in Annex IV / V REACH, exempted from registration

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

Use of the substance/ mixture: General industrial

Restrictions on use: No data available

1.3 Details of the supplier of the safety data sheet

Address: Dixons Gas Ltd
Newbiggin Lane
Westerhope
Newcastle upon Tyne
Tyne and Wear
NE5 1LX

Email address: Orders@dixonsgas.co.uk

Telephone: +44 (0)191 271 4888

1.4 Emergency telephone number

Telephone: +44 (0)191 271 4888

Only available on weekdays during the hours of 08:00 to 17:00

SECTION 2: Hazards identification

2.1 Classification of the substance or 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

2.2 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 statements

Prevention:	P220: Keep away from clothing and other combustible materials P244: Keep valves and fittings free from oil and grease
Response:	P370 and P376: In case of a fire, stop leak if safe to do so
Storage:	P403: Store in a well-ventilated place

2.3 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

3.1 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 deadline not expired

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

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

3.2 Mixtures: Not applicable

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice:	Remove 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, get medical advice/attention.
Skin contact:	Adverse effect not expected from this product. If exposed or concerned, get 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.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms: No data available

4.3 Indication of any immediate medical attention and special treatment needed

Treatment: If exposed or concerned, get medical attention/advice

SECTION 5: Fire fighting measures

5.1 Extinguishing media

Suitable extinguishing media:	All known extinguishing media can be used
Extinguishing media which must not be used for safety reasons:	No data available

5.2	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.
5.3	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

6.1	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.
6.2	Environmental precautions:	Do not discharge into any place where it's accumulation could be dangerous. Prevent further leakage or spillage if safe to do so
6.3	Methods and material for containment and cleaning up:	Ventilate the area
	Additional advice:	If possible, stop flow of product. Increase ventilation to the release area and monitor oxygen level. If leak is from cylinder or cylinder valve, call the emergency telephone number. If the leak is in the user's system, close the cylinder valve and safely vent the pressure before attempting repairs
6.4	Reference to other sections:	For more information refer to sections 8 and 13

SECTION 7: Handling and storage

7.1 Precautions for safe handling

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 (122°F). 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. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Use an adjustable strap wrench to remove over-tight or rusted caps. 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. wrench, screwdriver, pry bar, etc.) into valve cap 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 re-compress 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. When returning cylinder install valve outlet cap or plug leak tight. 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 (122°F)

7.2 Conditions for safe storage, including any incompatibilities

Containers should be stored in a purpose build 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 (122°F). 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 whit local regulations.

7.3 Specific end use(s)

Refer to section 1 or the extended MSDS if applicable

SECTION 8: Exposure controls/personal protection

8.1 Control parameters: If applicable, refer to the extended section of the MSDS for further information on CSA

8.2 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 working gloves when handling gas containers. Gloves must be clean and free of oil and grease. Standard EN 388 - Protective gloves against mechanical risk.

Eye/face protection:	Safety glasses recommended when handling cylinders. Standard EN 166 - Personal eye-protection.
Skin/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
Environmental exposure controls remarks:	If applicable, refer to the extended section of the MSDS for further information on CSA.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

(A/B) Physical state/colour:	Compressed gas. Colourless gas
(C) Odour:	No odour warning properties
(D) Density:	0.0013 g/cm3 (0.081 lb/ft3) at 21 °C (70 °F) Note: as vapour
(E) Relative density:	1.1 (water = 1)
(F) Melting point/freezing point:	-362 °F (-219 °C)
(G) Boiling point/range:	-297 °F (-183 °C)
(H) Vapour pressure:	Not applicable
(I) Water solubility:	0.039 g/l
(J) Partition coefficient: N-octanol/water [log Kow]	Not applicable for inorganic gases
(K) pH:	Not applicable for gases and gas mixtures
(L) Viscosity:	No reliable data available
(M) Particle characteristics:	Not applicable for gases and gas mixtures
(N) Upper and lower explosion/flammability limits:	Non flammable
(O) Flash point:	Not applicable for gases and gas mixtures
(P) Autoignition temperature:	Non flammable
(Q) Decomposition temperature:	Not applicable

9.2 Other information

Explosive properties:	Not applicable
Oxidizing properties:	Ci =1
Molecular weight:	32 g/mol
Odour threshold:	Odour threshold is subjective and inadequate to warn of overexposure
Evaporation rate:	Not applicable for gases and gas mixtures
Flammability (solid, gas):	Refer to product classification in section 2
Specific volume:	0.7540 m3/kg (12.08 ft3/lb) at 21 °C (70 °F)

Relative vapour density:	1.105 (air = 1) Heavier than air.

SECTION 10: Stability and reactivity

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

SECTION 11: Toxicological information

11.1 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

Acute toxicity

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

Chronic toxicity or effects from long term exposures

Carcinogenicity:	No data available
Reproductive toxicity:	No data is available on the product itself
Germ cell mutagenicity:	No data is available on the product itself
Specific target organ systemic toxicity (single exposure):	No data available

Specific target organ systemic toxicity (repeat 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

12.1 Toxicity

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

12.2	Persistence and degradability:	No data available
12.3	Bioaccumulative potential:	Refer to Section 9.1 (J) - partition coefficient (n-octanol/water)
12.4	Mobility in soil:	Because of its high volatility, the product is unlikely to cause ground pollution
12.5	Results of PBT and vPvB assessment:	If applicable, refer to the extended section of the MSDS for further information on CSA
12.6	Other adverse effects:	No ecological damage caused by this product
	Global warming potential:	No data available
	Effect on the ozone layer: (Ozone depleting potential)	No data available

SECTION 13: Disposal considerations

13.1	Waste treatment methods:	Return unused product in original cylinder to supplier. Contact supplier if guidance is required. Refer to the EIGA code of practice Doc. 30 “Disposal of Gases”, downloadable at http://www.eiga.org for more guidance on suitable disposal methods. List of hazardous waste codes: 16 05 04: Gases in pressure containers (including halons) containing dangerous substances.
13.2	Contaminated packaging:	Return cylinder to supplier

SECTION 14: Transport information

ADR	UN/ID number:	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 number:	UN1072
	Proper shipping name:	OXYGEN, COMPRESSED
	Class or division:	2.2
	Label(s):	2.2 (5.1)
	Marine pollutant:	No
IMDG	UN/ID number:	UN1072
	Proper shipping name:	OXYGEN, COMPRESSED
	Class or division:	2.2
	Label(s):	2.2 (5.1)
	Marine pollutant:	No
	Segregation group:	None
RID	UN/ID number:	UN1072
	Proper shipping name:	OXYGEN, COMPRESSED
	Class or division:	2
	Label(s):	2.2 (5.1)
	Marine pollutant:	No

Transport in bulk according to Annex II of Marpol and the IBC code

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

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Country	Regulatory List	Notification
USA	TSCA	Included on inventory
EU	EINECS	Included on inventory
Canada	DSL	Included on inventory
Australia	AICS	Included on inventory
Japan	ENCS	Included on inventory
South Korea	ECL	Included on inventory
China	SEPA	Included on inventory
Philippines	PICCS	Included on inventory

Other regulations

REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

Regulation (EC) No 1272/2008 the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006

Control of Substances Hazardous to Health Regulations 2002 (as amended)

Health and Safety at Work etc. Act 1974

Management of Health and Safety at Work Regulations (Northern Ireland) 2000 c.388, and as amended

The Health and Safety at Work etc. Act 1974 (Application to Environmentally Hazardous Substances) Regulations 2002 (England and Wales and Scotland) 11 March 2002 c.282, and as amended

Health and Safety at Work Order (Application to Environmentally Hazardous Substances) Regulations (Northern Ireland) 2003 (Northern Ireland) 14 March 2003 c52, and as amended

The Control of Major Accident Hazards Regulations 2015 c483

The Control of Major Accident Hazards Regulations (Northern Ireland) 2015 c325

The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2011 c1885, and as amended

The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations with amendments (Northern Ireland) 2011 c365

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 c.407

The Water Environment Regulations (Northern Ireland) 2017 c.81

Pollution Prevention and Control Act 1999 c.24

The Fluorinated Greenhouse Gases Regulations 2015 c.310

The Fluorinated Greenhouse Gases Regulations (Northern Ireland) 2015 c.425

The Acetylene Safety (England and Wales and Scotland) Regulations 2014 c.1639

The Highly Flammable Liquids and Liquefied Petroleum Gases Regulations 1972 c.917

The Highly Flammable Liquids and Liquefied Petroleum Gases Regulations (Northern Ireland) 1975 c.256

Dangerous Substances and Explosive Atmospheres Regulations (Northern Ireland) 2003 c.152

The Dangerous Substances and Explosive Atmospheres Regulations 2002 c.2776

Pollution Prevention and Control Act 1999

The Environmental Permitting (England and Wales) Regulations 2016

Ozone Depleting Substances Regulations 2015

15.2	Chemical safety assessment:	A CSA does not need to be carried out for this product

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

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 Protection Equipment
Kow	Octanol-water partition coefficient
DNEL	Derived No Effect Level
LC50	Lethal Concentration to 50 % of a test population
LD50	Lethal Dose to 50% of a test population (Median Lethal Dose)
NOEC	No Observed Effect Concentration
PNEC	Predicted No Effect Concentration
RMM	Risk Management Measure
OEL	Occupational Exposure Limit
PBT	Persistent, Bioaccumulative and Toxic
vPvB	Very Persistent and Very Bioaccumulative
STOT	Specific Target Organ Toxicity
CSA	Chemical Safety Assessment
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
WGK	Water Hazard Class

Key literature references and sources of data

ECHA Guidance on the compilation of safety data sheets

ECHA Guidance on the application of the CLP Criteria

ARIEL database

Prepared by: **Air Products and Chemicals, Inc. Global EH&S Department**

For additional information, please visit our Product Stewardship web site at **http://www.airproducts.com/productstewardship/**

This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws. COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

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