Revision: 16 August 2021

SAFETY DATA SHEET

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

1.1 Product identifier

- Product Name: Oxygen
- Product Description: Non-flammable, non-toxic, oxidising, compressed gas
- Chemical formula: O_2
- CAS No.: 7782-44-7
- EC No.: 231-956-9

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

- Use of the substance/mixture: Gas Welding/Heating/Brazing/Cutting; Industrial use
- Use advised against: No information available

1.3 Details of the supplier of the safety data sheet

- Name of Supplier: SGS Gases Ltd
- Address of Supplier: Poplar Farm
  Eastertown
  Weston-super-Mare
  Somerset
  BS24 0HY
  UK
- Telephone: 01934 751265
- Email: enquiries@sgsgases.co.uk

1.4 Emergency telephone number

- Emergency Telephone: 01934 751265
  Monday – Friday 8:30am – 5pm

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

- Classification (REGULATION (EC) No 1272/2008) [CLP/GHS]: Ox. Gas 1, H270; Press. Gas (Comp.), H280
- Additional information: For full text of Hazard- and EU Hazard-statements: see section 16

2.2 Label elements

Signal Word: Danger

Hazard statements

H270 - May cause or intensify fire; oxidiser
H280 - Contains gas under pressure; may explode if heated.

Precautionary statements

P220 - Keep away from clothing and other combustible materials.
P370+P376 - In case of fire: Stop leak if safe to do so.
P244 - Keep valves and fittings free from oil and grease.
P410+P403 - Protect from sunlight. Store in a well-ventilated place.

Supplemental Hazard information (EU)

SECTION 2: Hazards identification (....)

None

2.3 Other hazards

- Not a PBT according to REACH Annex XIII
- Not a vPvB according to REACH Annex XIII
- Does not contain any substances with endocrine disrupting properties

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical Name	Conc.	CAS No.	EC No.	Classification (REGULATION (EC) No 1272/2008) [CLP/GHS]	SCL/ M-Factor/ ATE	REACH Registration Number	WEL/ OEL
Oxygen	100%	7782-44-7	231-956-9	Ox. Gas 1, H270 Press. Gas, H280	-	-	No

3.2 Mixtures

- Not applicable

SECTION 4: First aid measures

Rescuers should put on approved personal protective equipment (PPE) before administering first aid

No action shall be taken involving any personal risk or without suitable training

4.1 Description of first aid measures

Contact with eyes

No hazard expected under normal conditions of use
If exposed or concerned: Get medical advice/attention.

Contact with skin

No hazard expected under normal conditions of use
If exposed or concerned: Get medical advice/attention.

Ingestion

No hazard expected under normal conditions of use

Inhalation

Remove person to fresh air and keep comfortable for breathing.
Keep warm and at rest, in a half upright position. Loosen clothing
Apply artificial respiration only if patient is not breathing
If heartbeat is absent, give external cardiac compression
Get medical advice/attention.

4.2 Most important symptoms and effects, both acute and delayed

Contact with eyes

No hazard expected under normal conditions of use

Contact with skin

No hazard expected under normal conditions of use

Ingestion

SECTION 4: First aid measures (....)

No hazard expected under normal conditions of use

Inhalation

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.

4.3 Indication of any immediate medical attention and special treatment needed

- Treat symptomatically
- 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.

SECTION 5: Firefighting measures

5.1 Extinguishing media

- Suitable extinguishing media: In case of fire use water spray or fog, alcohol resistant foam, dry chemical or carbon dioxide
- Unsuitable extinguishing media: High volume water jet

5.2 Special hazards arising from the substance or mixture

- May accelerate combustion
- In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion
- Inform Fire Brigade of potential danger of exploding and rocketing cylinders
- Most cylinders are designed to vent contents when exposed to elevated temperatures.
- 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.

5.3 Advice for firefighters

- Special protective equipment: Wear self-contained breathing apparatus (SCBA). Wear full protective clothing including chemical protection suit.
- Keep container(s) exposed to fire cool, by spraying with water
- Collect contaminated fire extinguishing water separately. This MUST not be discharged into drains. Prevent fire extinguishing water from contaminating surface or ground water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- No action shall be taken involving any personal risk or without suitable training
- Only trained and authorised personnel should carry out emergency response
- Clothing exposed to high concentrations may retain oxygen for 30 minutes or longer and become a potential fire hazard.
- Personal precautions for non-emergency personnel: Shut off all ignition sources; Evacuate the area and keep personnel upwind
- Personal precautions for emergency responders: Shut off all ignition sources; Evacuate the area and keep personnel upwind; Ensure adequate ventilation; Monitor oxygen level; Gas/vapour is heavier than air and may accumulate in confined spaces, particularly at or below ground level.; Wear protective clothing as per section 8

6.2 Environmental precautions

- Do not release to the environment except for emergency ventilation.

6.3 Methods and material for containment and cleaning up

SECTION 6: Accidental release measures (....)

- Ventilate 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 SGS Gases telephone number. If the leak is in the user's system, close the cylinder valve and safely vent the pressure before attempting repairs.
- Cylinder should be inspected and tested if leak occurs.

6.4 Reference to other sections

- See section(s): 7, 8 & 13

SECTION 7: Handling and storage

7.1 Precautions for safe handling

- Only experienced and properly instructed persons should handle gases under pressure.
- Ensure adequate ventilation
- Do not breathe gas
- 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.
- 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.
- Open valve slowly. 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.
- Close valve after each use and when empty.
- Replace outlet caps or plugs and container caps as soon as container is disconnected from equipment.
- Do not subject containers to abnormal mechanical shocks which may cause damage to their valve or safety devices.
- Never attempt to lift a cylinder by its valve protection cap or guard.
- 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.

SECTION 7: Handling and storage (....)

- 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).
- Prolonged periods of cold temperature below -30°C (-20°F) should be avoided.

7.2 Conditions for safe storage, including any incompatibilities

- Containers should not be stored in conditions likely to encourage corrosion.
- Store in a cool, dry well-ventilated place. Keep container tightly closed.
- Do not expose to temperatures exceeding 50°C/ 122°F.
- Protect from sunlight.
- 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.
- 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.
- Store containers in location free from fire risk and away from sources of heat and ignition.
- Full and empty cylinders should be segregated. Containers should be segregated in the storage area according to the various categories - (e.g. flammable, toxic,etc.) and in accordance with local regulations.
- Keep away from combustible material.
- Flammable storage areas should be separated from oxygen and other oxidizers by a minimum distance of 20 ft. (6.1 m.) or by a barrier of non-combustible material at least 5ft. (1.5 m.) high, having a fire resistance rating of at least 1/2 hour.
- Return empty containers in a timely manner.

7.3 Specific end use(s)

- Gas Welding/Heating/Brazing/Cutting

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

- If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
  Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace exposure - Measurement of exposure by inhalation to chemical agents - Strategy for testing compliance with occupational exposure limit values). European Standard EN 14042 (Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents). European Standard EN 482 (Workplace exposure. General requirements for the performance of procedures for the measurement of chemical agents). Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Oxygen

No exposure limits have been set for this substance

8.2 Exposure controls

- Selection and use of personal protective equipment should be based on a risk assessment of exposure potential
- Engineering controls
  Ensure adequate ventilation
  Avoid oxygen rich (>23.5%) atmospheres.
  Gas detectors should be used when oxidising gases may be released.
- Respiratory protection
  No respiratory protection is needed during normal handling

SECTION 8: Exposure controls/personal protection (....)

- Skin protection
  Wear protective gloves
  Sturdy work gloves are recommended for handling cylinders. Standard EN 388 - Protective gloves against mechanical risk.
  The breakthrough time of the selected glove(s) must be greater than the intended use period.
  Gloves must be clean and free of oil and grease.
  Safety shoes are recommended when handling cylinders. Standard EN ISO 20345 - Personal protective equipment - Safety footwear.
- Eye/face protection
  Wear safety glasses approved to standard EN 166.
- Thermal hazards
  Not applicable
- Hygiene measures
  Use good personal hygiene practices
  Do not eat, drink or smoke when using this product.
  Wash thoroughly after handling.
- Environmental exposure controls
  Do not release to the environment except for emergency ventilation.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

- Physical state: Compressed gas
- Colour: Colourless
- Odour: None
- Melting point/freezing point: -362 °F (-219 °C)
- Boiling point or initial boiling point and boiling range: -297 °F (-183 °C)
- Flammability: Not combustible, but will contribute to the combustion of other materials. May cause violent, sometimes explosive reactions.
- Lower and upper explosion limit: No data available
- Flash point: Not applicable
- Auto-ignition temperature: No data available
- Decomposition temperature: No data available
- pH: Not applicable
- Kinematic viscosity: Not applicable
- Solubility: 0.039 g/L
- Partition coefficient n-octanol/water (log value): No data available
- Vapour pressure: No data available
- Density and/or relative density: 1.1 (water = 1)
- Relative vapour density: 1.1 (air = 1)
- Particle characteristics: Not applicable

9.2 Other information

- Gas/vapour is heavier than air and may accumulate in confined spaces, particularly at or below ground level.
- Molecular weight: 32 g/mol
- Density: 0.0013 g/cm³ (0.081 lb/ft³) at 21 °C (70 °F) Note: (as vapour)
- Specific Volume: 0.7540 m³/kg (12.08 ft³/lb) at 21 °C (70 °F)
- Critical temperature: -180 °F (-118 °C)

SECTION 10: Stability and reactivity

SECTION 10: Stability and reactivity (....)

10.1 Reactivity

- Considered stable under normal conditions

10.2 Chemical stability

- Stable under normal conditions

10.3 Possibility of hazardous reactions

- Violently oxidises organic material

10.4 Conditions to avoid

- Avoid extremes of temperature

10.5 Incompatible materials

- May react violently with reducing agents
- Keep away from flammable and combustible materials.
- Keep away from organic materials
- Keep equipment free from oil and grease

10.6 Hazardous decomposition products

- No hazardous decomposition products known

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

- Acute Toxicity
  Based on available data, the classification criteria are not met

Substances

Chemical Name	LD_{50} (oral, rat)	LC_{50} (inhalation, rat)	LD_{50} (dermal, rabbit)
Oxygen	No data available	No data available	No data available

- Skin corrosion/irritation
  Based on available data, the classification criteria are not met

Substances

Chemical Name	Irritation/corrosion
Oxygen	No data available

- Serious eye damage/irritation
  Based on available data, the classification criteria are not met

Substances

Chemical Name	Irritation/corrosion
Oxygen	No data available

- Respiratory or skin sensitisation
  Based on the available data, the classification criteria are not met

Substances

Chemical Name	Skin sensitisation	Respiratory sensitisation
Oxygen	No data available	No data available

- Germ cell mutagenicity
  Based on available data, the classification criteria are not met

SECTION 11: Toxicological information (....)

Substances

Chemical Name	Toxicity - In Vitro	Toxicity - In Vivo
Oxygen	No data available	No data available

- Carcinogenicity
  Based on available data, the classification criteria are not met

Substances

Chemical Name	NOAEL (oral, rat)	NOAEC (inhalation, rat)	NOAEL (dermal, rat)
Oxygen	No data available	No data available	No data available

- Reproductive toxicity
  Based on available data, the classification criteria are not met

Substances

Chemical Name	NOAEL (oral, rat)	NOAEC (inhalation, rat)	NOAEL (dermal, rat)
Oxygen	No data available	No data available	No data available

- Specific target organ toxicity (STOT) - single exposure
  Based on the available data, the classification criteria are not met
- Specific target organ toxicity (STOT) - repeated exposure
  Based on the available data, the classification criteria are not met

Substances

Chemical Name	NOAEL (oral, rat)	NOAEC (inhalation, rat)	NOAEL (dermal, rat)
Oxygen	No data available	No data available	No data available

- Aspiration hazard
  Based on the available data, the classification criteria are not met
- Contact with eyes
  No hazard expected under normal conditions of use
- Contact with skin
  No hazard expected under normal conditions of use
- Ingestion
  No hazard expected under normal conditions of use
- Inhalation
  No hazard expected under normal conditions of use
  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 hours)
  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

11.2 Information on other hazards

- Does not contain any substances with endocrine disrupting properties

SECTION 12: Ecological information

12.1 Toxicity

- Based on available data, the classification criteria are not met

Substances

Chemical Name	LC_{50} (fish)	EC_{50} (aquatic invertebrates)	EC_{50} (aquatic algae)
Oxygen	No data available	No data available	No data available

12.2 Persistence and degradability

- No data available

Substances

Chemical Name	Biodegradation
Oxygen	No data available

12.3 Bioaccumulative potential

- Bioaccumulation is not expected

Substances

Chemical Name	Bioconcentration Factor (BCF)	Log Kow
Oxygen	No data available	No data available

12.4 Mobility in soil

- No data available

Substances

Chemical Name	Adsorption/desorption
Oxygen	No data available

12.5 Results of PBT and vPvB assessment

- Not a PBT according to REACH Annex XIII
- Not a vPvB according to REACH Annex XIII

12.6 Endocrine disrupting properties

- No information available

12.7 Other adverse effects

- No information available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

- May be vented to atmosphere in a well ventilated place
- Do not discharge into any place where its accumulation could be dangerous
- Disposal should be in accordance with local, state or national legislation
- Cylinders should be returned to suppliers

13.2 Classification

- The waste must be identified according to the List of Wastes (2000/532/EC)
- Hazardous Property Code(s): HP 2 Oxidising

SECTION 14: Transport information

14.1 UN number or ID number

- UN No.: 1072

14.2 UN proper shipping name

- Proper Shipping Name: OXYGEN, COMPRESSED

14.3 Transport hazard class(es)

- Hazard Class: 2.2 (5.1)

14.4 Packing group

- Packing Group: Not applicable

14.5 Environmental hazards

- Not Classified

14.6 Special precautions for user

- 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.
- Avoid transport on vehicles where the load space is not separated from the driver's compartment.
- Before transporting product containers ensure there is adequate ventilation and:
  - they are firmly secured and the cylinder valve is closed and not leaking;
  - the valve outlet cap nut or plug (where provided) is correctly fitted;
  - the 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 a SGS Gases customer service representative.

14.7 Maritime transport in bulk according to IMO instruments

- Not applicable

14.8 Road/Rail (ADR/RID)

- ADR UN No.: 1072
- Proper Shipping Name: OXYGEN, COMPRESSED
- ADR Hazard Class: 2 (5.1)
- ADR Packing Group: Not applicable
- Tunnel Code: (E)

14.9 Sea (IMDG)

- IMDG UN No.: 1072
- Proper Shipping Name: OXYGEN, COMPRESSED
- IMDG Hazard Class: 2.2 (5.1)
- IMDG Packing Group.: Not applicable

14.10 Air (ICAO/IATA)

- ICAO UN No.: 1072
- Proper Shipping Name: OXYGEN, COMPRESSED
- ICAO Hazard Class: 2.2 (5.1)
- ICAO Packing Group: Not applicable

SECTION 15: Regulatory information

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

- This safety data sheet is provided in compliance with REACH Regulation (EC) No 1907/2006 (as amended by Regulation (EU) 2020/878) and UK REACH
- The GB Classification, Labelling and Packaging Regulation (GB CLP) applies in Great Britain
- Regulation (EC) No. 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP Regulation) applies in Europe
- Seveso III Directive (2012/18/EU, Dangerous Substances in Annex I: Listed
- Restrictions on use according to Annex XVII to REACH Regulation: None

15.2 Chemical safety assessment

- A REACH chemical safety assessment has not been carried out

SECTION 16: Other information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. This company shall not be held liable for any damage resulting from handling or from contact with the above product.

Sources of data: Information from published literature and company data

Revision No. 2.0.0. Revised August 2021.
Changes made: Revised to conform to latest version of REACH Annex II.

Text not given with phrase codes where they are used elsewhere in this safety data sheet:

- H270: May cause or intensify fire; oxidiser
- H280: Contains gas under pressure; may explode if heated

Acronyms

- ATE: Acute Toxicity Estimate
- CAS: Chemical Abstracts Service
- DNEL: Derived No-Effect Level
- EC: European Community
- EC_{50}: Effective Concentration, 50%
- GHS: Globally Harmonised System
- LC_{50}: Lethal Concentration, 50%
- LD_{50}: Lethal Dose, 50%
- NOAEC: No observed adverse effect concentration
- NOAEL: No observed adverse effect level
- OEL: Occupational Exposure Limit
- PBT: Persistent, Bioaccumulative and Toxic
- PNEC: Predicted No-Effect Concentration
- REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals
- SCL: Specific Concentration Limit
- SVHC: Substances of Very High Concern
- vPvB: very Persistent and very Bioaccumulative
- WEL: Workplace Exposure Limit

--- end of safety datasheet ---