

1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

| | |
|----------------------|---------------------------|
| Commercial name | Oxygen |
| Our codes | 12002001 |
| Chemical description | Oxygen |
| | CAS No. 7782-44-7 |
| | EC No. 231-956-9 |
| | EC Index No. 008-001-00-8 |
| Chemical formula | O ₂ |

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

Industrial sector: Refrigeration and air-conditioning

Type of use: Test gas / Calibration gas. Welding, cutting, heating and brazing. Shield gas for welding processes.
Laser gas. Laboratory use.

Application: Industrial and professional. Perform risk assessment prior to use.

1.3 Details of the supplier of the safety data sheet



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Fax : +39 0322 838813
E-mail : laboratorio@mariel.it

1.4 Emergency telephone number

| | | |
|--|------------------------|--|
| Mariel Srl | +39 0322 838319 | Hours: 8.30-12.30 / 13.30-17.30 |
| CAV-CNIT Anti-Poison (toxicological) National Information Centre | +39 0382 24444 | Hours: 24 h / 24 h |

2. Hazards identification

2.1 Classification of the substance or mixture

Regulation (EC) 1272/2008 (CLP/GHS)

| | | |
|-------------------|--------------------------------------|------|
| Physical Hazards: | Oxidising Gases, Category 1 | H270 |
| | Gases under pressure: Compressed gas | H280 |

2.2 Label elements

Dangerous pictogram



| | |
|------------------------------|---|
| Signal word (CLP) | Danger |
| Hazard statements (H) | H270 May cause or intensify fire; oxidizer. |
| | H280 Contains gas under pressure; may explode if heated. |
| Precautionary statements (P) | |
| - 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. |

2.3 Other hazards

None.

3. Composition/information on ingredients

3.1 Substances

| Substance name | Contents | CAS No. | EC No. | Index No. | Registration No. | Classification 67/548/EEC |
|----------------|----------|-----------|-----------|--------------|------------------|---|
| Oxygen | 100% | 7782-44-7 | 231-956-9 | 008-001-00-8 | * 1 | Ox. Gas 1, H270 Press. Gas (Comp.), H280 |

Contains no other components or impurities which will influence the classification of the product

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

*2 : Registration deadline not expired.

*3 : Registration not required: substance manufactured or imported <1t/y.

3.2 Mixtures

Not applicable

4. First aid measures



General information: If the person is unconscious, place it in the recovery position and get immediately medical attention. Do not give anything to an unconscious person. If breathing is irregular, give oxygen. If breathing stopped, administer artificial respiration. If symptoms persist, call a physician.

4.1 Description of first aid measures

| | |
|--------------|---|
| Inhalation | Remove patient from exposure to fresh air. |
| Skin contact | Adverse effects not expected from this product. |
| Eye contact | Adverse effects not expected from this product. |
| Ingestion | Adverse effects not expected from this product. |

4.2 Most important symptoms and effects, both acute and delayed

Continuous inhalation of concentrations higher than 75%, may cause nausea, dizziness, respiratory difficulty and convulsion. Refer to section 11.

4.3 Indication of any immediate medical attention and special treatment needed

None

5. Firefighting measures

5.1 Extinguishing media

| | |
|--------------------------------|---------------------|
| Suitable extinguishing media | Water spray or fog. |
| Unsuitable extinguishing media | Water jet. |

5.2 Special hazards arising from the substance or mixture

| | |
|----------------------|--|
| Specific hazards | Supports combustion. Exposure to the source of heat and/or to the fire may cause containers to rupture/explode. |
| Hazardous combustion | None. |

5.3 Advice for firefighters

| | |
|--|--|
| Specific methods | Coordinate fire measure to the surrounding fire. If possible, stop flow of the product. From protected position, cool endangered containers with water spray jet. |
| Special protective equipment for fire fighters | Firefighters must use standard protective equipment including flame resistant clothing, helmet with face shield, gloves, protective boots and in enclosed spaces, SCBA. Firefighters must use standard protective equipment including. Guideline: EN 469 Protective clothing for firefighters. Performance requirements for protective clothing for firefighting. EN 15090 Footwear for firefighters. EN 659 Protective gloves for firefighters. EN 443 Helmets for firefighting in buildings and other structures. EN 137 Respiratory protective devices - Self-contained open circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking. |

Other information

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

6. Accidental release measure

6.1 Personal precautions, protective equipment and emergency procedures

Try to stop release.

Evacuate the area.

Monitor concentration of released product.

Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.

Eliminate ignition sources if safe to do so.

Ensure adequate air ventilation.

Act in accordance with local emergency plan.

6.2 Environmental precautions

Try to stop leak if safe to do so.

Remove containers from area of fire if safe to do so.

Do not release the product into the environment.

Avoid any spills and leaks.

6.3 Methods and material for containment and cleaning up

Ventilate/aerate the area/local.

6.4 Reference to other sections

See section 8 and 13.

7. Handling and storage

7.1 Precautions for safe handling

| | |
|--------------------|---|
| Technical measures | <p>The product must be handled in accordance with good industrial hygiene and safety procedures.</p> <p>Only experienced and properly instructed persons should handle gases under pressure.</p> <p>Consider pressure relief device(s) in gas installations.</p> <p>Service technician must check regularly your entire gas system to ensure that it is leak-free.</p> <p>Do not smoke, eat or drink when handling product.</p> <p>Keep equipment free from oil and grease.</p> <p>Use properly specified equipment which is suitable for this product, its supply pressure and temperature.</p> <p>Use only oxygen approved lubricants and oxygen approved sealing.</p> <p>Use only with equipment cleaned for oxygen service and rated for cylinder pressure.</p> <p>Do not breathe gas. Contact your supplier if in doubt.</p> |
| Safe handling | <p>Refer to supplier's handling instructions.</p> <p>Do not allow back-feed into the container.</p> <p>Protect containers from physical damage; do not drag, roll, slide or drop.</p> <p>When moving containers, even for short distances, use appropriate equipment (trolley, hand truck, fork truck, etc.) designed to transport cylinders.</p> <p>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.</p> <p>If user experiences any difficulty operating cylinder valve, discontinue use and contact the supplier.</p> <p>Damaged valves should be reported immediately to the supplier.</p> <p>Never attempt to repair or modify container valves or safety relief devices.</p> <p>Keep container valve outlets clean and free from contaminates particularly oil and water.</p> <p>Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.</p> <p>Close container valve after each use and when empty, even if still connected to equipment.</p> <p>Never attempt to transfer gases from one container to another.</p> <p>Never use direct flame or electrical heating devices to raise the pressure of a container.</p> <p>Do not remove or deface labels provided by the supplier for the identification of the container contents.</p> <p>Suck back of water into the container must be prevented.</p> <p>Open valve slowly to avoid pressure shock.</p> |
| Industrial hygiene | <p>Ensure adequate ventilation of the working area.</p> |

7.2 Conditions for safe storage, including any incompatibility

Requirements for storage areas and containers

Observe all regulations and local requirements regarding storage of containers.

Containers should not be stored in conditions likely to encourage corrosion.

Containers valve or caps should be in place.

Keep containers tightly closed in a dry, cool and well-ventilated place (below 50 °C), away from any ignition or heat sources.

Keep away from combustible materials.

Store in original container.

7.3 Specific end use(s)

None.

8. Exposure controls/personal protection

8.1 Control parameters

| | | |
|--|---|-----------------|
| OEL Occupational Exposure Limit | : | None available. |
| DNEL Derived No-Effect Level | : | None available. |
| PNEC Predicted No-Effect Concentration | : | None available. |

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Provide adequate general and local exhaust ventilation.

Systems under pressure should be regularly checked for leakages.

Avoid oxygen rich (>23,5%) atmospheres.

Gas detectors should be used when oxidising gases may be released.

Consider the use of a work permit system e.g. for maintenance activities.

8.2.2 Individual protection measures, such as personal protective equipment

A risk assessment should be conducted and documented in each work area to assess the risks related to use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered: PPE compliant to the recommended EN/ISO standards should be selected.

a) Eye/face protection

Safety glasses with side-shields (according to directive EN 166).

b) Skin protection

i) Hand protection

Thermal-protective gloves resistant to chemical products (EN 374). The penetration time of the gloves must be greater than the period of expected use. Gloves should be replaced immediately if they show signs of wear or deterioration.

ii) Other

Wear long-sleeved clothes. Remove or clean contaminated clothing.

Apron or protective clothing are not necessary.

c) Respiratory protection

Mask filter for gases and vapours (EN141). To obtain an adequate protection, filter class you should choose according to the type and concentration of contaminants. The breathing apparatus with filters do not operate satisfactorily when the air contains high concentrations of vapours. In case of insufficient ventilation, wear self-contained breathing apparatus (EN529).



8.2.3. Environmental exposure controls

Handling in accordance with good industrial hygiene and safety practice. Prevent spillage or leakage of the product in watercourse or sewers (explosion danger). Avoid air emissions. Refer to local regulations for restriction of emissions in atmosphere. See section 7 and 13.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

| | | |
|----|---|--|
| a) | Appearance | Gas |
| | Colour | Colourless |
| b) | Odour | No odour warning properties |
| d) | pH | Not applicable to gases and gas mixtures |
| e) | Melting point [°C] | - 219 °C at hPa (- 362.2 °F) |
| f) | Initial boiling point | - 183 °C at hPa (- 297.4 °F) |
| g) | Flash point | Not applicable to gases and gas mixtures |
| h) | Evaporation rate [ether=1] | Not applicable to gases and gas mixtures |
| i) | Flammability (solid, gas) | Non flammable |
| j) | Upper flammability | Non flammable |
| | Lower flammability | Non flammable |
| k) | Vapour pressure | Not applicable to gases and gas mixtures |
| l) | Vapour density (air = 1) | Not applicable |
| m) | Relative density (air = 1) | 1,1 |
| n) | Solubility (in the water– mg/l) | 39 mg/l |
| o) | Partition coefficient: n-Octanol/water | Not applicable for inorganic gases |
| r) | Viscosity (at 20° C) [mPa.s] | No data available |
| s) | Explosive properties | Not applicable |
| t) | Oxidising properties | Oxidiser |

9.2 Other information

| | |
|---|-----------------------|
| Molecular mass [g/mol] | 32 g/mol |
| Critical temperature | - 118 °C (- 180.4 °F) |
| Coefficient of oxygen equivalency (Ci) | 1 |

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 handling and storage conditions

10.3 Possibility of hazardous reactions

Violently oxidises organic materials.

10.4 Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources.

Protect from sunlight and do not expose to temperatures exceeding 50° C.

10.5 Incompatible materials

May react violently with combustible materials and reducing agents.

Consider the potential toxicity hazard due to the presence of chlorinated or fluorinated polymers in high pressure (>30bar) oxygen lines in case of combustion.

No reaction with any common materials in dry or wet conditions.

10.6 Hazardous decomposition products

None.

11. Toxicological information

11.1 Information on toxicological effects

| | |
|--|--|
| a) Acute toxicity | Based on available data, no toxicological effects from this product. |
| b) Skin corrosion/Skin irritation | Based on available data, no known effects from this product. |
| c) Serious eye damage/irritation | Based on available data, no known effects from this product. |
| d) Respiratory sensitisation | Based on available data, no known effects from this product. |

| | |
|---------------------------|--|
| e) Germ cell mutagenicity | Based on available data, no known effects from this product. |
| f) Carcinogenicity | Based on available data, no known effects from this product. |
| g) Reproductive toxicity | Based on available data, no known effects from this product. |
| <i>Fertility</i> | Based on available data, no known effects from this product. |
| <i>Unborn child</i> | Based on available data, no known effects from this product. |
| h) STOT-single exposure | Based on available data, no known effects from this product. |
| i) STOT-repeated exposure | Based on available data, no known effects from this product. |
| j) Aspiration hazard | Not applicable to gases and gas mixtures. |

12. Ecological information

12.1 Toxicity

No ecological damage caused by this product.

EC50 48h – Daphnia magna (mg/l) No data available.

EC50 72h – Algae (mg/l) No data available.

LC50 96h – Fish (mg/l) No data available.

12.2 Persistence and degradability

No ecological damage caused by this product.

12.3 Bioaccumulative potential

No ecological damage caused by this product.

12.4 Mobility in soil

No ecological damage caused by this product.

12.5 Results of PBT and vPvB assessment

Not classified as PBT or vPvB.

12.6 Other adverse effects

Other adverse effects No known effects from this product.

Ozone Depletion Potential ODP None

Global Warming Potential (GWP) No ecological damage caused by this product

13. Disposal consideration

13.1 Waste treatment methods

General information Contact the supplier if guidance is required. May be vented to atmosphere in a well ventilated place. Do not discharge into any place where its accumulation could be dangerous. Ensure that the emission levels from local regulations or operating permits are not exceeded.

Disposal methods Refer to the EIGA code of practice (Doc. 30/10 "Disposal of Gases", downloadable at <http://www.eiga.org>) for more guidance on suitable disposal methods. Dispose of container via supplier only. Discharge, treatment, or disposal may be subject to national, state, or local laws. Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations. The user is obliged to observe EU, state and/or local regulations on waste disposal.

European Waste Codes (EWC)

16 05 04 : Gases in pressure containers (including halons) containing dangerous substances.

13.2 Additional information

External treatment and disposal waster should comply with applicable local and/or national regulations.

For further background information on waste disposal, see Directive 94/62/EC.

14. Transport information

14.1 UN Number 1072

Hazard labels

ADR/RID, IMDG, IATA/ICAO



2.2 Non-flammable, non-toxic gas.

5.1 Oxidizing substances.

ADR (Transport by road) / RID (Transport by rail)

| | |
|--|--------------------|
| 14.2 UN proper shipping name | Oxygen, compressed |
| 14.3 Transport hazard class(es) | 2 |
| Classification code | 10 |
| Hazard identification number | 25 |
| 14.4 Packing group | |
| Tunnel restriction code | E |
| 14.5 Environmental hazards | No |

IATA/ICAO (Transport by air)

| | |
|--|--------------------|
| 14.2 UN proper shipping name | Oxygen, compressed |
| 14.3 Transport hazard class(es) | 2 |
| Class / Div. (Sub. Risk(s)) | 2.2 (5.1) |
| 14.4 Packing group | |
| Cargo and Passenger aircraft | 200 |
| Cargo aircraft only | 200 |
| 14.5 Environmental hazards | No |

IMDG, Amdt 34-08 (Transport by sea)

| | |
|--|--------------------|
| 14.2 UN proper shipping name | Oxygen, compressed |
| 14.3 Transport hazard class(es) | 2.2 (5.1) |
| Emergency Schedule (EmS) - Fire | F-C |
| Emergency Schedule (EmS) - Spillage | S-V |
| 14.4 Packing group | |
| IMDG code | P200 |
| 14.5 Environmental hazards | No |

Special precautions for user

- Avoid transport on vehicles where the load space is not separated from the driver's.
- 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 that containers are firmly secured.
- Ensure cylinder valve is closed and not leaking.
- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
- Ensure valve protection device (where provided) is correctly fitted.

14.7 Transport in bulk according in Annex II of Marpol and the IBC Code

Not applicable.

15. Regulatory information

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

Ozone Depletion Potential (ODP) None
Global Warming Potential (GWP) No ecological damage caused by this product

Additional regulations/legislations

Regulation (EC) No 1906/2007 - Regulation REACH No. 1907/2006 - Regulation (EC) n. 1272/2008 - Directive 67/548/CEE
Seveso Directive 96/82/EC: Listed

15.2 Chemical safety assessment

A Chemical Safety Assessment (CSA) does not need to be carried out for this product.

16. Other information

This Material Safety Data Sheet has been made according regulation (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006.

Text of H and P phrases in section 2

H270 May cause or intensify fire; oxidizer.
H280 Contains gas under pressure; may explode if heated.
P220 Keep away from clothing and other combustible materials.
P244 Keep valves and fittings free from oil and grease.
P370 + P376 In case of fire: stop leak if safe to do so.
P403 Store in a well ventilated place.

| | | | | |
|----------------|---|---|-------------------------|-------------------------|
| History | Version 4 by Mariel Srl Revision date: 04/2018 | Version 3 by Mariel Srl Revision date: 02/2013 | Version 2 by Mariel Srl | Version 1 by Mariel Srl |
|----------------|---|---|-------------------------|-------------------------|

b) Abbreviations and acronyms

| | |
|----------|---|
| ADR | Accord Dangerous Route |
| CAS | Chemical Abstracts Service |
| CE | European Community |
| CLP | Classification, Labelling and Packaging |
| DSD | Dangerous Substances Directive |
| DPD | Dangerous Preparations Directive |
| EC | European Commission |
| EC50 | Half maximal effective concentration |
| EIGA | European Industrial Gases Association |
| GHS | Globally Harmonised System |
| GWP | Global Warming Potential |
| LC50 | Half maximal lethal concentration |
| IATA | International Air Transport Association |
| IBC Code | International Maritime Organization (Code) |
| ICAO | International Civil Aviation Organization |
| IMDG | International Maritime Dangerous Goods |
| MARPOL | MARitime POLLution |
| ODP | Ozone Depletion Potential |
| PBT | Persistent Bio-accumulative Toxic (substance) |
| RID | Rail International Dangerous Goods |
| REACH | Registration, Evaluation, Authorisation and Restriction of Chemicals (Regulation (EC) n. 1907/2006) |
| vPvB | very Persistent very Bioaccumulative |

Notice of liability

This information should not constitute a guarantee for any specific product properties. This information are only a guidance for safe handling, use, processing, storage, transportation, disposal and release and are not to be considered a warranty or a quality specification.

The information contained in this safety data sheet are based on our current knowledge and EU and national laws; they describe the product only with regard to safety requirements. The conditions of the user are beyond our knowledge and control. The product should not be used for purpose other than those specified. It is always the responsibility of the user to take all the necessary measures to comply with the requirements of current legislation. The information contained in this form should not considered as a guarantee of its properties.