



SAFETY DATA SHEET

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Revised edition no : 2

Date : 1 / 6 / 2015

Supersedes : 18 / 11 / 2011

Medicinal Oxygen (refrigerated)**097B_MED**

2.2 : Non-flammable, non-toxic gases 5.1 : Oxidizing substances

Danger

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

1.1. Product identifier

Trade name : Ossigeno Liquido Refrigerato
SDS no : 097B_MED
Chemical description : Oxygen (refrigerated)
CAS No : 7782-44-7
EC No : 231-956-9
Index No : 008-001-00-8
Registration-No. : Listed in Annex IV / V REACH, exempted from registration.
Chemical formula : O₂

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

Relevant identified uses : Industrial and professional. Perform risk assessment prior to use.
Medical use therapeutic and/or diagnostic.
Contact supplier for more information on uses.

1.3. Details of the supplier of the safety data sheet

Company identification : Sapio Life Srl
Via S. Pellico, 48
20900 Monza ITALIA
E-Mail address (competent person) : sds@sapio.it

1.4. Emergency telephone number

Emergency telephone number : +39 0295705444

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

Hazard Class and Category Code Regulation EC 1272/2008 (CLP)

• Physical hazards : Oxidizing gases - Category 1 - Danger - (CLP : Ox. Gas 1) - H270
Gases under pressure - Refrigerated liquefied gas - Warning - (CLP : Press. Gas Ref. Liq.) - H281

2.2. Label elements

Labelling Regulation EC 1272/2008 (CLP)

• Hazard pictograms

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SECTION 2. Hazards identification (continued)

- Hazard pictograms code : GHS03 - GHS04
- Signal word : Danger
- Hazard statements : H270 - May cause or intensify fire; oxidiser.
H281 - Contains refrigerated gas; may cause cryogenic burns or injury.
- Precautionary statements
 - Prevention : P244 - Keep valves and fittings free from oil and grease
P282 - Wear cold insulating gloves/face shield/eye protection.
P220 - Keep away from combustible materials.
 - Response : P336+P315 - Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice / attention.
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.

SECTION 3. Composition/information on ingredients

3.1. Substance / 3.2. Mixture

Substance.

Substance name	Contents	CAS No	EC No	Index No	Registration no	Classification
Oxygen (refrigerated)	100 %	7782-44-7	231-956-9	008-001-00-8	* 1	Ox. Gas 1 (H270) Press. Gas Ref. Liq. (H281)

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.

Full text of H-statements see section 16.

SECTION 4. First aid measures

4.1. Description of first aid measures

- Inhalation : Remove victim to uncontaminated area.
- Skin contact : In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.
- Eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.
- Ingestion : Ingestion is not considered a potential route of exposure.

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.

4.3. Indication of any immediate medical attention and special treatment needed

: None.



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SECTION 5. Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Water spray or fog.
- Unsuitable extinguishing media : Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

- Specific hazards : Exposure to fire may cause containers to rupture/explode. Supports combustion.
- Hazardous combustion products : None.

5.3. Advice for fire fighters

- Specific methods : Move containers away from the fire area if this can be done without risk. If possible, stop flow of product. Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. If leaking do not spray water onto container. Water surrounding area (from protected position) to contain fire. Use water spray or fog to knock down fire fumes if possible.
- Special protective equipment for fire fighters : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. EN 943-2: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Gas-tight chemical protective suits for emergency teams.

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- : Try to stop release. Monitor concentration of released product. Ensure adequate air ventilation. Eliminate ignition sources. Evacuate area. Use protective clothing. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Act in accordance with local emergency plan. Stay upwind.

6.2. Environmental precautions

- : Try to stop release.

6.3. Methods and material for containment and cleaning up

- : Liquid spillages can cause embrittlement of structural materials. Ventilate area. Keep area evacuated and free from ignition sources until any spilled liquid has evaporated (ground free from frost).

6.4. Reference to other sections

- : See also sections 8 and 13.



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SECTION 7. Handling and storage

7.1. Precautions for safe handling

Safe use of the product

- : Only experienced and properly instructed persons should handle gases under pressure. The substance must be handled in accordance with good industrial hygiene and safety procedures.
- Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
- Use no oil or grease.
- Do not smoke while handling product.
- Keep equipment free from oil and grease.
- Use only oxygen approved lubricants and oxygen approved sealings.
- Use only with equipment cleaned for oxygen service and rated for cylinder pressure.
- Ensure the complete gas system was (or is regularly) checked for leaks before use.
- Consider pressure relief device(s) in gas installations.
- Do not breathe gas.
- Avoid release of product into atmosphere.

Safe handling of the gas receptacle

- : Suck back of water into the container must be prevented.
- Open valve slowly to avoid pressure shock.
- Do not allow backfeed into the container.
- Never attempt to repair or modify container valves or safety relief devices.
- Damaged valves should be reported immediately to the supplier.
- Keep container valve outlets clean and free from contaminants particularly oil and water.
- Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.
- Close container valve after each use and when empty, even if still connected to equipment.
- Never use direct flame or electrical heating devices to raise the pressure of a container.
- Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.

7.2. Conditions for safe storage, including any incompatibilities

- : Observe all regulations and local requirements regarding storage of containers.
- Segregate from flammable gases and other flammable materials in store. Containers should be stored in the vertical position and properly secured to prevent them from falling over.
- Keep container below 50°C in a well ventilated place. Stored containers should be periodically checked for general condition and leakage. 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.
- Containers should not be stored in conditions likely to encourage corrosion. Keep away from combustible materials.

7.3. Specific end use(s)

- : None.

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

DNEL: Derived no effect level (Workers)

- : No data available.

PNEC: Predicted no effect concentration

- : No data available.

8.2. Exposure controls

8.2.1. Appropriate engineering controls

- : 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.
- Provide adequate general and local exhaust ventilation.
- Consider work permit system e.g. for maintenance activities.

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SECTION 8. Exposure controls/personal protection (continued)

- 8.2.2. Individual protection measures, e.g. personal protective equipment** : PPE compliant to the recommended EN/ISO standards should be selected.
A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered:
Protect eyes, face and skin from liquid splashes.
- **Eye/face protection** : Wear goggles and a face shield when transfilling or breaking transfer connections.
Wear safety glasses with side shields.
Standard EN 166 - Personal eye-protection.
 - **Skin protection**
 - **Hand protection** : Wear working gloves when handling gas containers.
Standard EN 388 - Protective gloves against mechanical risk.
 - **Other** : Wear safety shoes while handling containers.
Standard EN ISO 20345 - Personal protective equipment - Safety footwear.
Standard EN ISO 14116 - Limited flame spread materials.
Consider the use of flame resistant safety clothing.
 - **Respiratory protection** : None necessary.
 - **Thermal hazards** : Wear cold insulating gloves when transfilling or breaking transfer connections.
Standard EN 511 - Cold insulating gloves.
- 8.2.3. Environmental exposure controls** : None necessary.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

- Appearance**
- Physical state at 20°C / 101.3kPa** : Gas.
- Colour** : Bluish liquid.
- Odour** : No odour warning properties.
- Odour threshold** : Odour threshold is subjective and inadequate to warn of overexposure.
- pH value** : Not applicable.
- Molar mass [g/mol]** : 32
- Melting point [°C]** : -219
- Boiling point [°C]** : -183
- Critical temperature [°C]** : -118
- Flash point [°C]** : Not applicable for gases and gas mixtures.
- Evaporation rate (ether=1)** : Not applicable for gases and gas mixtures.
- Flammability range [vol% in air]** : Non flammable.
- Vapour pressure [20°C]** : Not applicable.
- Relative density, gas (air=1)** : 1.1
- Relative density, liquid (water=1)** : 1.1
- Solubility in water [mg/l]** : 39
- Partition coefficient n-octanol/water [log Kow]** : Not applicable for inorganic gases.
- Auto-ignition temperature [°C]** : Not applicable.
- Viscosity at 20°C [mPa.s]** : Not applicable.
- Explosive Properties** : Not applicable.
- Oxidising Properties** : Oxidiser.
- Coefficient of oxygen equivalency (Ci)** : 1



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SECTION 9. Physical and chemical properties (continued)

9.2. Other information

Other data

: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

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.
Risk of explosion if spilled on organic structural materials (e.g. wood or asphalt).

10.4. Conditions to avoid

: None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

: May react violently with combustible materials.
Consult supplier for specific recommendations.
May react violently with reducing agents.
Consider the potential toxicity hazard due to the presence of chlorinated or fluorinated polymers in high pressure (> 30 bar) oxygen lines in case of combustion.
Keep equipment free from oil and grease.
For additional information on compatibility refer to ISO 11114.

10.6. Hazardous decomposition products

: None.

SECTION 11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity	: No known toxicological effects from this product.
Skin corrosion/irritation	: No known effects from this product.
Serious eye damage/irritation	: No known effects from this product.
Respiratory or skin sensitisation	: No known effects from this product.
Carcinogenicity	: No known effects from this product.
Germ cell mutagenicity	: No known effects from this product.
Reproductive toxicity	: No known effects from this product.
STOT-single exposure	: No known effects from this product.
STOT-repeated exposure	: No known effects from this product.
Aspiration hazard	: Not applicable for gases and gas mixtures.



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SECTION 12. Ecological information

12.1. Toxicity

Assessment : No ecological damage caused by this product.

12.2. Persistence and degradability

Assessment : No ecological damage caused by this product.

12.3. Bioaccumulative potential

Assessment : No ecological damage caused by this product.

12.4. Mobility in soil

Assessment : 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

: Can cause frost damage to vegetation.

Effect on the ozone layer : None.

Effect on global warming : None.

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.
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.
Consult supplier for specific recommendations.

List of hazardous waste codes (from Commission Decision 2001/118/EC) : 16 05 04: Gases in pressure containers (including halons) containing dangerous substances.

13.2. Additional information

: None.

SECTION 14. Transport information

14.1. UN number

UN number : 1073

Labelling ADR, IMDG, IATA

: 2.2 : Non-flammable, non-toxic gases
5.1 : Oxidizing substances

14.2. UN proper shipping name

Transport by road/rail (ADR/RID) : OXYGEN, REFRIGERATED LIQUID

Transport by air (ICAO-TI / IATA-DGR) : OXYGEN, REFRIGERATED LIQUID

Transport by sea (IMDG) : OXYGEN, REFRIGERATED LIQUID

14.3. Transport hazard class(es)

Transport by road/rail (ADR/RID)

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SECTION 14. Transport information (continued)

Class : 2
Classification code : 3 O
H.I. nr : 225
Tunnel Restriction : C/E Tank carriage: Passage forbidden through tunnels of category C, D and E; Other carriage: Passage forbidden through tunnels of category E

Transport by air (ICAO-TI / IATA-DGR)

Class / Division (Subsidiary risk(s)) : 2.2 (5.1)

Transport by sea (IMDG)

Class / Division (Subsidiary risk(s)) : 2.2 (5.1)

Emergency Schedule (EmS) - Fire : F-C

Emergency Schedule (EmS) - Spillage : S-W

14.4. Packing group

Transport by road/rail (ADR/RID) : Not applicable.

Transport by air (ICAO-TI / IATA-DGR) : Not applicable.

Transport by sea (IMDG) : Not applicable.

14.5. Environmental hazards

Transport by road/rail (ADR/RID) : None.

Transport by air (ICAO-TI / IATA-DGR) : None.

Transport by sea (IMDG) : None.

14.6 Special precautions for user

Packing Instruction(s)

Transport by road/rail (ADR/RID) : P203

Transport by air (ICAO-TI / IATA-DGR)

Passenger and Cargo Aircraft : DO NOT LOAD IN PASSENGER AIRCRAFT.

Cargo Aircraft only : FORBIDDEN.

Transport by sea (IMDG) : P203

Special precautions for user : 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.
Before transporting product containers:
- 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.
- Ensure there is adequate ventilation.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not applicable.



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SECTION 15. Regulatory information

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

EU legislation

Restrictions on use : None.

Seveso directive 96/82/EC : Listed.

National legislation

National legislation : Ensure all national/local regulations are observed.

15.2. Chemical safety assessment

: A CSA does not need to be carried out for this product.

SECTION 16. Other information

Indication of changes : Revised safety data sheet in accordance with commission regulation (EU) No 453/2010.

Training advice : Ensure operators understand the hazard of oxygen enrichment.

Further information : This Safety Data Sheet has been established in accordance with the applicable European Union legislation.

List of full text of H-statements in section 3. : H270 - May cause or intensify fire; oxidiser.
H281 - Contains refrigerated gas; may cause cryogenic burns or injury.

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Details given in this document are believed to be correct at the time of going to press. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

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