Safet data sheet

Conforme au Règlement (CE) N° 1907/2006 (REACH) tel que modifié par le Règlement (UE) 2015/830

REFRIGERATED LIQUID OXYGEN

Date d'émission : 14/10/2021 Date de révision : 14/10/2021 Version: 5.0

Référence FDS : : EIGA097B

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

1.1. Product identifier

Trade name : REFRIGERATED LIQUID OXYGEN
MSDS No. : EIGA097B
Chemical description

CAS number: 7782-44-7
N°ONE: 1073
EC number: 231-956-9

Registration number Listed in Annex IV/V of REACH, exempt from registration
Chemical formula O2 _

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

Relevant uses identified : Industrial and professional. Carry out a risk analysis before use
Test or calibration gas
Welding, cutting and brazing.
Protective gas for welding processes.
Water treatment.
Use in the manufacture of electronic or photovoltaic components.
Laboratory use
Food applications
Contact the supplier for more information on use

Uses advised against Consumer use

1.3. Information regarding the supplier of the safety data sheet

Company identification : SARL RAYANOX
Z.A. Bethioua Wilaya from Oran , Algeria
Phone: 041-79-35-22
Fax: 041-79-32-23
Contact@rayanox.co
sarlrayanox@gmail.com

1.4. Emergency call number

Emergency call number Phone: +21365550342

SECTION 2: Hazard Identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Physical hazards	Oxidizing gases, Category 1	H270
	Gases under pressure: Refrigerated liquid gases	H281

2.2. Label elements

Labeling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)

GHS03 GHS04

Signal word (CLP) : Hazard
Hazard statements (CLP) : H270 - May cause or aggravate a fire; fuel.
: H281 - Contains refrigerated gas; may cause cryogenic burns or injuries.

Precautionary statements (CLP)

– Prevention: : P220 - Keep away from combustible materials.
P244 - No oil or grease on taps and fittings.
P282 - Wear cold insulating gloves and face or eye protection. Cold insulating gloves, face protection equipment, eye protection equipment.

– Intervention: : P336+P315 - Thaw frozen parts with lukewarm water. Do not rub the affected areas. Consult a physician immediately.
P370+P376 - In the event of fire: close the leak if it can be done without danger.

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

2.3. Other dangers

: None).

SECTION 3: Composition/information on ingredients

3.1. Substances

NAME	Product identifier	%	Impurities (ppm v/v)	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Chilled liquid oxygen	(CAS No.) 7782-44-7 (EC No.) 231-956-9	99,995	$H_2O \leq 67$ $CO \leq 5$ $CO_2 \leq 300$	Ox. Gas 1, H270 Press. Gas (Ref. Liq.), H281

Does not contain other components or impurities which could modify the classification of the product.

3.2. Blends: Not applicable

SECTION 4: First Aid

4.1. Description of first aid

- Inhalation: Move the victim to an uncontaminated area, wearing a breathing apparatus
  Individual Autonomous (ARI). Keep victim warm and at rest. Call a doctor.
  Perform cardiopulmonary resuscitation if victim stops breathing and breathes more.
  Evacuate the victim to an 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 with plenty of water for at least 15 minutes
- Ingestion: Ingestion is not considered a possible mode of exposure

4.2. Most important symptoms and effects, both acute and delayed

Continuous inhalation of concentrations above 75% may cause nausea, dizziness, breathing difficulties and convulsions.
Refer to section 11.

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

: None).

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing agents : Water spray or cloud
- Unsuitable extinguishing agents : do not use a water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

Specific risks : Maintains combustion.
Exposure to fire may cause containers to rupture and explode

Hazardous Combustion Products : None).

5.3. Tips for firefighters

Specific methods : Use extinguishing media suitable for surrounding fire. Exposure to fire and heat may cause gas containers to rupture. Cool exposed containers with water spray from a protected location. Do not allow watering water used in emergency cases to flow into the gutters.
If possible, stop the gas flow.
Use water spray or cloud to reduce the fumes to the ground if possible
In the event of a leak, do not spray the container with water. Hose down surrounding area (from protected location) to contain fire.
Move containers from fire area if it can be done without risk.

Special protective equipment for firefighters : Protective clothing and self-contained breathing apparatus for firefighters
Standard EN 469: protective clothing for firefighters. Standard EN 659: Protective gloves
For firefighters

SECTION 6: Measures to be taken in the event of accidental release

6.1. Personal precautions, protective equipment and emergency procedures

Try to stop the leak
Evacuate the area.
Check the concentration of the rejected product.
Wear a self-contained breathing apparatus (SCBA) when entering the area unless you have verified that it is safe.
Eliminate sources of ignition
Use protective clothing
Provide adequate air ventilation.
Act according to the local emergency plan.
Stay upwind

6.2. Precautions for environmental protection

Try to stop the leak.
Liquid spills can cause embrittlement of building materials

6.3. Methods and material for containment and cleaning up

Ventilate the area

6.4. Reference to other SECTIONS

See also sections 8 and 13

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Safety when using the product	The product must be handled in accordance with good industrial hygiene and safety procedures. Only persons with appropriate experience and training should handle gases under pressure. Consider adding pressure safety valve(s) to the installation. You ensure that the entire gas installation has been (or is regularly) checked for the absence of leaks, before use Do not smoke while handling the product. Keep equipment free of oil and grease Do not use oil or grease. Use only specified equipment appropriate for this product and its operating pressure and temperature. Contact your gas supplier if in doubt. Use only lubricants and sealants approved for oxygen service Use only with cleaned equipment, approved for oxygen use and rated for cylinder pressures Avoid the return of water, acids and alkalis. Do not breathe gas.
Safety when handling the gas container	Refer to supplier's instructions for container handling. Prohibit products from coming back into the container Protect bottles from physical damage, do not pull, roll, slide, drop To move the bottles even over a short distance, use a trolley (bottle roller, etc.), designed for transporting bottles Leave the valve protective cap in place until the container is again secured either by a wall or bracket or placed in a container or moved into position for use. If the user encounters any difficulty when opening or closing the cylinder valve, he must discontinue use and contact the supplier Never attempt to repair or modify a vessel's valve or its pressure relief devices. Damaged valves must be reported to the supplier immediately Keep container valve outlets clean and uncontaminated, especially with oil or water. If the container has been equipped with one, as soon as it has been disconnected from the installation, replace the cap or the tap outlet plug. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to transfer gases from one cylinder/container to another package. Never use a direct flame or electric heater to increase the pressure in the container. Do not remove or damage the labels put on by the supplier to identify the contents of the bottle. Prevent water from being drawn into container. Open the tap slowly to avoid a sudden build-up of pressure (water hammer).

7.2. Conditions for safe storage, including any incompatibilities

Follow all local regulations and requirements for container storage.
Containers should not be stored in conditions likely to aggravate corrosion.
Container valve covers or caps must be in place.
Containers must be stored in an upright position and secured to prevent falling.
Containers in stock should be periodically checked for general condition and absence of leaks.
Store the container in a well-ventilated area, at a temperature below 50°C
In storage, separate flammable gases and other flammable materials
Store containers in places not exposed to the risk of fire and away from sources of heat and ignition.
Keep away from combustible materials

7.3. Specific end use(s)

: None).

SECTION 8: Exposure controls/personal protection

8.1. Control Settings

OEL (Occupational Exposure Limits)	: Not available.
DNEL (Derived No Effect Dose)	: Not available.
PNEC (Predicted No Effect Concentration(s))	: Not available.

8.2. Exposure controls

8.2.1. Appropriate technical controls

Maintain adequate local and general exhaust ventilation.
Pressure equipment must be checked regularly to check for leaks
Avoid oxygen-enriched atmospheres (>23.5%)
Gas detectors should be used when oxidizing gases are likely to be released
Think about work permits, e.g. for servicing.

8.2.2. Personal protective equipment

A risk analysis of the use of the product must be carried out and documented in all workplaces affected by the use of the product in order to choose personal equipment regarding the identified risks. The following recommendations should be considered
Choose Personal Protective Equipment that complies with recommended EN/ISO standards.

- Eye/face protection: Wear tight safety glasses and a face shield when transferring or disconnecting transfer lines.
  Standard EN 166 - Individual eye protection - Specifications.
- Skin protection
  - Hand protection: Wear protective gloves when handling gas cylinders.
    Standard EN 388-Protective gloves against mechanical risks.
    Wear cold-insulating gloves during transfer operations or disconnection of transfer lines.
    Standard EN 511 - Insulating gloves against the cold.
  - Miscellaneous: Consider the use of fire-resistant safety clothing.
    Standard EN ISO 14116 - Materials with limited flame expansion.
    Wear safety shoes when handling cylinders.
    Standard EN ISO 20345: Personal Protective Equipment - safety shoes.
- Respiratory protection: None required under normal use. Self-contained breathing apparatus must be used when working with this product in confined spaces.
- Thermal risks: Wear insulating gloves against the cold. Wear cold-insulating gloves when transferring or breaking the transfer.

8.2.3. Ambient Exposure Controls

Refer to local regulations for atmospheric emission restrictions. See Section 13 for specific methods for treating waste gases.

SECTION 9: Physical and chemical properties

Information on essential physical and chemical properties

Appearance	
• Physical state at 20°C / 101.3kPa	: Gas
• Color	: Blue liquid
Smell	: Not detectable by odor
Odor threshold	: Detection of thresholds by smell is subjective and inappropriate for warning in the event of overexposure
pH	: Not applicable to gases and gas mixtures.
Melting Point / Freezing Point	: -219°C / -218.4°C
Boiling point	: -183°C
Flash point	: Not applicable to gases and gas mixtures.
Evaporation rate	: Not applicable to gases and gas mixtures.
Flammability (solid, gas)	: Non-flammable.
Explosive limits	: Non-flammable.
Vapor pressure [20°C]	: Not applicable.
Vapor pressure [50°C]	: Not applicable.
Vapor density	: Not applicable.
Relative density, liquid (water=1)	: 1.1
Relative density, gas (air=1)	: 1.1
water solubility	: 39mg/l
Partition coefficient n-octanol/water (Log Kow)	: Not applicable to inorganic gases
Auto-ignition temperature	: Non-flammable.
Decomposition temperature	: Not applicable.
Viscosity	: No reliable data available.
Explosive properties	: Not applicable.
Oxidizing properties	: Oxidizing.

Other information

Molar mass	32 g/mol
Critical temperature [°C]	-118°C

Oxygen equivalence coefficient (Ci)	1

SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in the sections below

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Violently oxidizes organic matter.

Risk of explosion if the product spills on structures made of organic materials (e.g. wood or asphalt).

10.4. Conditions to avoid

Avoid humidity in installations.

10.5. Incompatible materials

May react violently with combustible materials.

May react violently with reducing agents.

Keep equipment free of oil and grease

Take into account, in the event that there is inflammation, the potential risk of toxicity due to the presence of chlorinated or fluorinated polymers in high pressure oxygen pipes (>30 bar).
For more information on compatibility, refer to ISO 11114.

Materials such as carbon steels, low alloy steels and plastic materials become brittle at low temperatures and are likely to break. Use
suitable materials resistant to the cryogenic conditions present in the systems of refrigerated liquefied gases
Consult supplier for specific recommendations

10.6. Hazardous decomposition products : None).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

acute toxicity	: This product has no known toxicological effects.
Skin corrosion/irritation	: No known effects with this product.
Serious eye damage/eye irritation	: No known effects with this product.
Respiratory or skin sensitization	: No known effects with this product.
Cell mutagenicity	: No known effects with this product.
Carcinogenicity	: No known effects with this product.
Toxic for reproduction: fertility	: No known effects with this product.
Toxic for reproduction: fetus	: No known effects with this product.
Specific target organ toxicity — single exposure	: No known effects with this product.
Specific target organ toxicity - repeated exposure	: No known effects with this product.
Inhalation hazard	: Not applicable to gases and gas mixtures

SECTION 12: Ecological information

12.1. Toxicity

Assessment	This product is harmless to the environment.
EC50 48h - Daphnia magna [mg/l]	No data available.
EC50 72h - Algae [mg/l]	None data available.
LC50 96 Hours - fish [mg/l]	No data available.

12.2. Persistence and degradability

Assessment This product is harmless to the environment.

12.3. Bioaccumulative potential

Assessment This product is harmless to the environment.

12.4. Mobility in the ground

Assessment Due to its high volatility, pollution of soil or water by this product is unlikely.
Penetration into the ground not likely .

12.5. Results of PBT and VPVB assessments

Assessment No data available.

12.6. Other adverse effects

Other adverse effects May 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

Contact supplier if instructions are needed.
Can be vented to a well-ventilated area
Do not dispose of in any place where its accumulation could be dangerous.
Verify that emission levels required by local regulations or operating permits are not exceeded.
For further recommendations on gas disposal methods, refer to the EIGA code of practice Doc 30 " Disposal of gases ", downloadable from http://www.eiga.eu.
Return the unconsumed product to the supplier in its original container

List of hazardous waste: 16 05 04: Gases in pressurized containers (including halons) containing substances Dangerous.

13.2. Further information

The treatment and disposal of waste by third parties must be in accordance with local and/or national legislation.

SECTION 14: Transport Information

14.1. UN number

UN number : 1073

14.2. UN proper shipping name

Transport by road/rail (ADR/RID) REFRIGERATED LIQUID OXYGEN
Air transport (ICAO-TI / IATA-DGR) Oxygen , refrigerated liquid
Transport by sea (IMDG) OXYGEN, REFRIGERATED LIQUID

14.3. Transport hazard class(es)

Labeling

2.2: Non-flammable, non-toxic gases.
5.1: Oxidizing materials.

Transport by road/rail (ADR/RID)

Class :2
Classification code : 3O
Danger no. : 225
Restriction of passage through tunnels : C/E - Prohibition to cross tunnels of categories C, D and E for transport in tanks. Prohibition on crossing category E tunnels.

Transport by sea (IMDG)

Class or division / Subsidiary risk(s) : 2.2 (5.1)

14.4. Packing group

Transport by road/rail (ADR/RID) : Not applicable
Air transport (ICAO-TI / IATA-DGR) : Not applicable
Transport by sea (IMDG) : Not applicable

14.5. Environmental hazards

Transport by road/rail (ADR/RID) : None).
Air transport (ICAO-TI / IATA-DGR) : None).
Transport by sea (IMDG) : None).

14.6. Special precautions to be taken by the user

Packaging instruction(s)

Transport by road/rail (ADR/RID) : P203
Air transport (ICAO-TI / IATA-DGR)
Passenger and cargo aircraft : Forbidden
Cargo plane only : forbidden
Transport by sea (IMDG) P203
Precautionary measures for transport Avoid transport in vehicles whose load compartment is not separated from the driver's cab.
Ensure that the vehicle driver is aware of the potential hazards of the load and the steps to take in the event of an accident or other emergency situation.
Before transporting containers:
- Make sure there is adequate ventilation.

- Make sure containers are firmly secured
- Make sure the cylinder valve is closed and not leaking
- Make sure that the valve outlet protective cap (when present) is correctly fitted.
- Ensure that the valve protection device (when present) is correctly fitted

14.7. Transport in bulk in accordance with Annex II of the Marpol Convention and the IBC Code

: Not applicable.

SECTION 15: Regulatory information

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

EU regulations

Employment Restrictions : None).

Seveso Directive 2012/18/EU (Seveso III) : Listed .

National guidelines

National regulations: : Ensure that all national or local regulations are followed.

Chemical Safety Assessment

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

SECTION 16: Other information

Indications of change : None).

Abbreviations and acronyms

ETA-Estimate of Acute Toxicity

CLP- Classification Labeling Packaging - Regulation (EC) No 1272/2008 relating to classification, labeling and packaging.
REACH - Registration, Evaluation, Authorization and Restriction of Chemicals – Regulation (EC) No 1907/2006 concerning the registration, evaluation and authorization of chemical substances, as well as the restrictions applicable to these substances.
EINECS - European Inventory of Existing Commercial Chemical Substances - Inventory

European marketed chemical substances

CAS number - numerical identifier assigned by the Chemical Abstract Service (USA)

PPE - Personal Protective Equipment

LC50 - Lethal Concentration - Lethal concentration for 50% of the population tested

RMM-Risk Management Measures

PBT - Persistent, Bioaccumulative and Toxic.

vPvB - very (very) Persistent and very (very) Bioaccumulative.

STOT - SE: Specific Target Organ Toxicity - Single Exposure ; Specific target organ toxicity - Single exposure.
CSA - Chemical Safety Assessment

EN - European Norm - European Norm

UN - United Nations - United Nations

ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road
IATA - International Air Transport Association - International Air Transport Association

IMDG Code - International Maritime Dangerous Goods Code - Code for maritime transport

Training tips : Ensure operators understand the risks of oxygen enrichment

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his impression
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