

## REFRIGERATED NITROUS OXIDE

Date d'émission : 14/10/2021

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Version : 5.0

Référence FDS : EIGA093B

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

#### 1.1. Product identifier

Trade name	REFRIGERATED NITROUS OXIDE
MSDS No.	EIGA003A
Chemical description	CAS number: 10024-97-2
	UN number: 2201
	EC number: 233-032-0
Registration number	Listed in Annex IV/V of REACH, exempt from registration
Chemical formula	N2O __

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

Relevant uses identified	See the list of identified uses and exposure scenarios in the appendix of the SDS.
Uses advised against	Do not inhale the product voluntarily, because of the risk of asphyxiation. Do not inhale the product voluntarily because of its narcotic effects

#### 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 <a href="mailto:Contact@rayanox.co">Contact@rayanox.co</a> <a href="mailto:sarlrayanox@gmail.com">sarlrayanox@gmail.com</a>
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#### 1.4. Emergency call number

Emergency call number	Phone: +21365550342
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### 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
Health hazards	Specific Target Organ Toxicity — Single Exposure, Category 3, Narcotic Effects	H336

#### 2.2. Label elements

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

Hazard pictograms (CLP)



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. : H336 - May cause drowsiness or dizziness.

Precautionary statements (CLP)	
– Prevention:	P260 - Do not breathe gases, vapors P244 - No oil or grease on taps and fittings. P220 - Keep away from clothing and other combustible materials. P282 - Wear cold insulating gloves and face or eye protection. Cold insulating gloves, face protection equipment, eye protection equipment.
– Intervention:	P304+P340+P315 - IF INHALED: remove victim to fresh air and keep at rest in a position where they can breathe comfortably. Consult a physician immediately.
–	P336+P315 - Thaw frozen parts with lukewarm water. Do not rub the affected areas. Consult a physician immediately.
– Storage :	P370+P376 - In the event of fire: close the leak if it can be done without danger. P403 - Store in a well-ventilated place.
Additional Information	Do not inhale the product voluntarily, because of the risk of asphyxiation. Do not inhale the product intentionally because of its narcotic effects.

#### 2.3. Other dangers

: None).

### SECTION 3: Composition/information on ingredients

### 3.1. Substances

NAME	Product identifier	%	Impurities in ppm				Classification according to Regulation (EC) No. 1272/2008 [CLP]
			H2O	NO	CO	CO2	
Nitrogen oxide refrigerated	(CAS No.) 10024-97-2 (EC no.) 233-032-0 REACH registration number: 01-2119970538-25	> 98	H2O	NO	CO	CO2	Ox. Gas 1, H270 Press. Gas (Ref. Liq.), H281 STOT SE 3, H336
			≤ 67	≤ 2	≤ 5	≤ 300	

### 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.
- 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

May have narcotic effects at low concentrations. Symptoms can be dizziness, headache, nausea and loss of coordination.  
Refer to section 11.

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

: Get medical attention.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

- Suitable extinguishing agents  
Water spray or cloud
- The product does not burn, use fire fighting measures appropriate to the surrounding fire
- Unsuitable extinguishing agents  
Do not use a jet of water 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  
Nitric oxide/nitrogen dioxide

### 5.3. Tips for firefighters

Specific methods  
Use extinguishing media suitable for the 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  
Use a self-contained breathing apparatus (SCBA) and gas-tight, chemical-resistant protective clothing  
Standard EN 943-2 : Protective clothing against liquid or gaseous chemicals, aerosols and solid particles. Gas-tight protective clothing for rescue teams.  
Standard EN 137 - Autonomous open circuit compressed air device with a mask full face.  
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

For non-rescuers  
Act according to the local emergency plan.  
Try to stop the leak.  
Evacuate the area.  
Eliminate sources of ignition  
Provide adequate air ventilation.  
Use protective clothing

For rescuers	<p>Prevent the product from entering sewers, basements, pits, or any other location where its accumulation could be dangerous.</p> <p>Stay upwind</p> <p>See section 8 of the SDS for more information on personal protective equipment</p> <p>Check the concentration of the rejected product.</p> <p>Wear a self-contained breathing apparatus (SCBA) when entering the area unless you have verified that it is safe.</p> <p>See section 5.3 of the SDS for more information.</p>
<b>6.2. <u>Precautions for environmental protection</u></b>	<p>Try to stop the leak.</p> <p>Liquid spills can cause embrittlement of building materials</p>
<b>6.3. <u>Methods and material for containment and cleaning up</u></b>	<p>Ventilate the area</p>
<b>6.4. <u>Reference to other SECTIONS</u></b>	<p>See also sections 8 and 13</p>

## 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

Temperatures above 150°C (300°F) should be avoided by all means possible to reduce the occurrence of explosive decomposition of nitrous oxide. clean all surfaces in direct contact with nitrous oxide as for oxygen service.

Transfer pumps must be equipped with a shut-off system to avoid running dry

Use self-limiting heating systems. Electric heaters with direct contact with the product are not permitted.

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)	:
Local Name	Nitrous oxide
OE TWA	180mg/m <sup>3</sup>
OEL TWA [ppm]	: 100ppm
Reference	: ILO and WHO 2018 ICSC: 0067 (June 2015)
DNEL (Derived No Effect Dose)	: None established.
PNEC (Predicted No Effect Concentration(s))	: None established.

### 8.2. Exposure controls

#### 8.2.1. Appropriate technical controls

Maintain adequate local and general exhaust ventilation.  
Product to be handled in a closed system.  
Pressure equipment must be checked regularly to check for leaks  
Ensure that exposure limits are not exceeded (if available).  
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

- Eye/face protection
- Skin protection
  - Hand protection
  - Miscellaneous
- Respiratory protection

A risk analysis of the use of the product must be conducted and documented in all workplaces involved in the use of the product in order to choose the personal safety equipment concerning the identified risks. The following recommendations should be considered  
Choose Personal Protective Equipment that complies with recommended EN/ISO standards.  
Wear tight safety glasses and a face shield when transferring or disconnecting transfer lines.  
Standard EN 166 - Individual eye protection - Specifications.

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.  
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.  
Gas filters can be used if all surrounding conditions are known eg concentration and type of impurities and duration of use.  
Use gas filters and a face mask when exposure limits can be exceeded for a short period e.g. connecting, disconnecting cylinders.  
Consult the product information of the respiratory equipment supplier to choose the most appropriate  
Gas filters do not protect against under oxygenation.  
Standard EN 14387 - Respiratory protective devices - Gas filters and combined filters and Standard EN 136 - Respiratory protective devices - full face masks.  
Have a personal self-contained breathing apparatus (SCBA) ready for use in an emergency  
Self-contained breathing apparatus recommended when there is a risk of unknown exposure during maintenance activities on installation equipment.  
Standard EN 137 - Autonomous open circuit compressed air device with a full face mask.  
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	: Colorless liquid.
Smell	: Sweetish. Difficult to detect at high concentration.
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	: -90.81°C
Boiling point	: -88.5°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]	: 50.8 bar (a).
Vapor pressure [50°C]	: Not applicable.
Vapor density	: Not applicable.
Relative density, liquid (water=1)	: 1.2
Relative density, gas (air=1)	: 1.5
water solubility	: 1500mg/l
Partition coefficient n-octanol/water (Log Kow )	: 0.4
Auto-ignition temperature	: Non-flammable.
Decomposition temperature	: Not applicable.
Viscosity	: No reliable data available.
Explosive properties	: Not applicable.
Oxidizing properties	: Oxidizing.
<b>Other information</b>	
Molar mass	44 g/mol
Critical temperature [°C]	-36.4°C
Oxygen equivalence coefficient (Ci)	0.6
Other data	Gas or vapor heavier than air. May accumulate in confined areas, especially low spots and basements.

## 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.

At temperatures above 575°C and atmospheric pressure, nitrous oxide decomposes into nitrogen and oxygen.

In the presence of catalysts ( e.g.: halogenated products, mercury, nickel, platinum), the speed rate increases and decomposition can then occur at even lower temperatures.

The decomposition of nitrous oxide is an irreversible phenomenon and of exothermic causing a considerable rise in pressure.

### 10.3. Possibility of hazardous reactions

May react violently with reducing agents

Violently oxidizes organic matter.

### 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 (>30bar ) .

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 materials resistant to the cryogenic conditions present in the systems of refrigerated liquefied gases

Consult supplier for specific recommendations

### 10.6. Hazardous decomposition products

: No hazardous decomposition products under normal conditions of use and storage \_

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

acute toxicity	: The classification criteria are not met.
LC50 Inhalation - Rat [ppm]	: 50000ppm/4h
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	: May cause drowsiness or dizziness.
Specific target organ toxicity - repeated exposure	: Haemotoxic effect. Neurological effect. At low concentrations: Central nervous system. Erythrocytes (red blood cells). Kidneys. Liver.
Target organ(s)	
Inhalation hazard	: Not applicable to gases and gas mixtures
Other information	Inhalation has narcotic effects

## 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	Not applicable to non-organic products
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### 12.3. Bioaccumulative potential

Assessment	No bioaccumulation to be expected in case of low log Kow (log Kow <4). See section 9.
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### 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 .
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### 12.5. Results of PBT and VPVB assessments

Assessment	No data available.
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### 12.6. Other adverse effects

Other adverse effects	: May cause frost damage to vegetation.
Effect on the ozone layer	: No effect on the ozone layer.
Global warming potential [CO2=1]	: 298
Effect on global warming	: May contribute to the greenhouse effect when discharged in large quantities. : Contains greenhouse gas(es).

## SECTION 13: Disposal Considerations

### 13.1. Waste treatment methods

List of hazardous waste	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 <a href="http://www.eiga.eu">http://www.eiga.eu</a> . Return the unconsumed product to the supplier in its original container 16 05 04: Gases in pressurized containers (including halons) containing substances Dangerous.
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### 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 : 2201

**14.2. UN proper shipping name**

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

**Air transport (ICAO-TI / IATA-DGR)**

**Transport by sea (IMDG)**

REFRIGERATED LIQUID NITROUS OXIDE  
Nitrous oxide, refrigerated liquid  
NITROUS OXIDE, 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 : 30

Danger no. : 225

Restriction of passage through tunnels : C/E - Prohibition on crossing 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 tap protection device (if it exists) is correctly put in place.
- place

**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

: None).

## Training tips

## DISCLAIMER OF LIABILITY

Before using this product for a new application or for testing, a thorough material compatibility study and risk analysis should be performed.

The information given in this document is believed to be accurate at the time of printing.

Despite the care taken in drafting this document, no liability can be accepted in the event of damage or accident resulting from its use.