

# Safety data sheet

Complies with Regulation (EC) No. 1907/2006 (REACH) as amended by Regulation (EU) 2015/830

## REFRIGERATED LIQUID NITROGEN

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SDS reference: EIGA089B

### SECTION 1: Identification of the Substance/Mixture and the Company/Undertaking

#### 1.1. Product identifier

Trade name	REFRIGERATED LIQUID NITROGEN
MSDS No.	EIGA089B
Chemical description	CAS number: 7727-37-9 N°ONE: 1977 EC number: 231-783-9
Registration number	Listed in Annex IV/V of REACH, exempt from registration
Chemical formula	N2

#### 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 Purge, dilution, inerting gas. Protective gas for welding processes. Use in the manufacture of electronic or photovoltaic components. 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 ZA Bethioua Wilaya of Oran, Algeria Tel: 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	Tel: +21365550342
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### SECTION 2: Hazards Identification

#### 2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]  
Physical hazards Gas under pressure: Refrigerated liquid gas H281

#### 2.2. Label elements

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

Hazard pictograms (CLP)



GHS04

Signal word (CLP)	: Attention
Hazard statements (CLP)	: H281 - Contains refrigerated gas; may cause cryogenic burns or injuries.
Precautionary statements (CLP)	

- Prevention: P282 - Wear cold-insulating gloves and face or eye protection. Insulating gloves against the cold, facial protective equipment, eye protection equipment.
- Intervention: P336+P315 - Thaw frozen parts with lukewarm water. Do not rub the affected areas. Seek medical attention immediately.
- Storage : P403 - Store in a well-ventilated area.

#### 2.3. Other dangers

: Asphyxiant at high concentration.

### SECTION 3: Composition/information on ingredients

#### 3.1. Substances

NAME	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Refrigerated liquid nitrogen	(CAS No.) 7727-37-9 (EC No.) 231-783-9	>99,999	Press. Gas (Ref. Liq.), H281

#### 3.2. Mixtures: Not applicable

## SECTION 4: First Aid

### 4.1. Description of first aid

- Inhalation  
Move the victim to an uncontaminated area, putting on a breathing apparatus Individual autonomy (ARI). Keep the victim warm and at rest. Call a doctor. Perform cardiopulmonary resuscitation if the victim stops breathing. Evacuate the victim to a non-contaminated 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

May cause asphyxiation at high concentrations. Symptoms may include loss of consciousness or motor skills. The victim may not be aware of the asphyxiation.  
Refer to section 11.

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

: None).

## SECTION 5: Fire Fighting Measures

### 5.1. Extinguishing media

- Suitable extinguishing agents  
Water spray or cloud  
The product does not burn, use fire-fighting measures appropriate for 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  
Exposure to fire may cause containers to rupture and explode

Hazardous combustion products  
None).

### 5.3. Advice 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. Water the surrounding area (from a protected location) to contain the fire.  
Move containers from fire area if it can be done without risk.  
Special protective equipment for firefighters  
Protective clothing and self-contained breathing equipment for firefighters  
Standard EN 469: protective clothing for firefighters. Standard EN 659: Protective gloves  
For firefighters

## SECTION 6: Measures To Be Taken In Case 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.  
Ensure adequate air ventilation.  
Use protective clothing.  
Prevent the product from entering sewers, basements, pits, or any other location where its accumulation could be dangerous.  
Stay upwind.  
See section 8 of the SDS for more information on personal protective equipment

For first aiders  
Wear a self-contained breathing apparatus (SCBA) when entering the area unless you have verified that it is safe.  
Oxygen detectors should be used when asphyxiating gases may be released.  
See section 5.3 of the SDS for more information

### 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.

Use only specified equipment appropriate for this product and its operating pressure and temperature. Contact your gas supplier if in doubt.

Avoid the return of water, acids and alkalis

Do not breathe the gas.

Avoid letting the product into the air

Refer to the supplier's instructions for handling the container.

Prohibit products from rising into the container

Protect cylinders from physical damage, do not pull, roll, slide, drop

To move the bottles even a short distance, use a cart (bottle rolls, etc.), designed for transporting bottles

Leave the tap protection cap in place until the container is again secured either by a wall or support or placed in a container or placed in position for use.

If the user encounters any difficulty opening or closing the cylinder valve, the user should discontinue use and contact the supplier

Never attempt to repair or modify a container valve or its pressure relief devices.

Damaged faucets should be reported immediately to the supplier

Keep tap outlets from containers clean and not contaminated, particularly 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 cap.

Close the container tap after each use and when empty, even if it is still connected to the equipment.

Never attempt to transfer gases from a bottle/container into another container.

Never use a direct flame or electric heater to increase the pressure in the container.

Do not remove or damage the labels put by the supplier to identify the contents of the bottle.

Prevent water from being drawn into the container.

Open the tap slowly to avoid a sudden build-up of pressure (water hammer).

Safety when handling the gas container

### 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

Store containers in areas 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 appropriate exhaust ventilation locally and overall.

Pressure equipment should be checked regularly for leaks

Gas detectors should be used when oxidizing gases are likely to be released

Think about work permits, e.g. for maintenance.

#### 8.2.2. Personal protective equipment

A risk analysis of the use of the product must be conducted and documented in all workplaces affected by the use of the product in order to choose personal safety equipment regarding the identified risks. The following recommendations should be considered

- Eye/face protection  
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.
- 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 or disconnection of transfer lines. Standard EN 511 - Insulating gloves against the cold.
  - Miscellaneous  
Wear safety shoes when handling cylinders. Standard EN ISO 20345: Personal Protective Equipment - safety shoes.
- Respiratory protection  
Self-contained breathing apparatus (SCBA) or mask with positive pressure air supply should be used in under-oxygenated atmospheres. Standard EN 137 - Autonomous open circuit compressed air device with full face mask
- Thermal risks  
Wear insulating gloves against the cold. Wear cold-insulating gloves when transferring or breaking the transfer.

### 8.2.3. Ambient exposure controls

None are necessary.

## 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

: Not detectable by odor

#### Olfactory 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

: -210°C

#### Boiling point

: -196°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)

: 0.8

#### Relative density, gas (air=1)

: 0.97

#### Water solubility

: 20 mg/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

: Not applicable.

### Other information

#### Molar mass

28 g/mol

#### Critical temperature [°C]

-147°C

#### Other data

Gas or vapor heavier than air. May accumulate in confined areas, especially in low areas 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.

### 10.3. Possibility of hazardous reactions

None).

### 10.4. Conditions to avoid

Avoid humidity in installations.

### 10.5. Incompatible materials

For further 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 appropriate materials resistant to the cryogenic conditions found in refrigerated liquefied gas systems  
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 ecologically safe.
EC50 48h - Daphnia magna [mg/l]	No data available.
EC50 72h - Algae [mg/l]	No data available.
LC50 96 Hours - fish [mg/l]	No data available.

### 12.2. Persistence and degradability

Assessment	This product is ecologically safe.
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### 12.3. Bioaccumulation potential

Assessment	This product is ecologically safe.
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### 12.4. Mobility in the ground

Assessment	This product is ecologically safe
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### 12.5. Results of PBT and VPVB assessments

Assessment	Not classified as PBT or vPvB
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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.
Effect on global warming	: None).

## SECTION 13: Disposal Considerations

### 13.1. Waste treatment methods

List of hazardous waste	Can be placed in a well-ventilated area
	Do not discharge into any location where its accumulation could be hazardous.
	Return the uneaten product to the supplier in its original container
	16 05 04: Gases in pressure vessels (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	: 1977
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### 14.2. UN proper shipping name

<u>Transport by road/rail (ADR/RID)</u>	REFRIGERATED LIQUID NITROGEN
<u>Air transport (ICAO-TI / IATA-DGR)</u>	Nitrogen, refrigerated liquid
<u>Transport by sea (IMDG)</u>	NITROGEN, REFRIGERATED LIQUID

### 14.3. Transport hazard class(es)

**Labeling**



2.2: Non-flammable, non-toxic gases.

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

Class :2  
 Classification code : 3A  
 Danger no. :22  
 Restriction of passage in 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

**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 : 202  
 Cargo plane only : 202  
 Transport by sea (IMDG) P203  
 Precautionary measures for transport  
 Avoid transport in vehicles where the 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:  
 Ensure there is adequate ventilation.  
 Make sure containers are firmly secured  
 Make sure the cylinder valve is closed and not leaking  
 Make sure that the faucet outlet protection cap (if it exists) is correctly in place.  
 Ensure that the tap protection device (if it exists) is correctly put in 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) : Not covered

**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 Standard

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

: The risks of asphyxiation are often underestimated and must be emphasized during operator training.

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.