

## 1. PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** Nitrogen, refrigerated liquid  
**CHEMICAL NAME:** Nitrogen  
**CHEMICAL FAMILY:** Inert gas  
**SYNONYMS:** Cryogenic Liquid Nitrogen, Liquid Nitrogen, LIN  
**CHEMICAL FORMULA:** N<sub>2</sub>  
**USE:** Medical purposes, Inerting, Safe storage of Food, Concrete strengthening, etc.,

**NAME AND ADDRESS:** **Refrigeration & Oxygen Co.**  
**Corporate Office**  
 Area No 1, Block 21 C,  
 Central Slaughter House Street  
 Shuwaikh Industrial Area  
 Kuwait.

**WEB ADDRESS:** [www.rockuwait.com](http://www.rockuwait.com); E-mail: info@rocq8.com  
**TELEPHONE:** (+965) 844 844

## 2. HAZARDS IDENTIFICATION

### EMERGENCY OVERVIEW:

**WARNING!** Extremely cold liquid and gas under pressure.  
 Can cause rapid suffocation.  
 Can cause severe frostbite.

### POTENTIAL HEALTH EFFECTS INFORMATION:

#### ROUTES OF EXPOSURE:

**INHALATION:** Simple Asphyxiant.

Nontoxic, but may cause suffocation by displacing the oxygen in air. Exposure to oxygen-deficient atmosphere (<19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8% to 10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.

**EYE CONTACT:** Tissue freezing and severe cryogenic burns of eyes

**SKIN CONTACT:** Tissue freezing and severe cryogenic burns of skin

**SKIN ABSORPTION:** Not applicable

**INGESTION:** Not applicable

**CHRONIC EFFECTS:** None established

**MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:** None

**OTHER EFFECTS OF OVEREXPOSURE:** None

**CARCINOGENICITY:** Not listed by NTP, OSHA, or IARC.

**POTENTIAL ENVIRONMENTAL EFFECTS:** No adverse ecological effects are expected.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME: Nitrogen  
PERCENTAGE >99%  
CAS NUMBER 7727-37-9

#### 4. FIRST AID MEASURES

**FIRST AID PROCEDURES:**

**INHALATION:** Persons suffering from lack of oxygen should be removed to fresh air. If victim is not breathing, give artificial respiration. If breathing is difficult, give oxygen. Obtain prompt medical attention.

**EYE CONTACT:** In case of splash contamination, immediately flush eyes with water for at least 15 minutes. See a physician, preferably an ophthalmologist.

**SKIN CONTACT:** Remove any clothing that may restrict circulation to frozen area. Do not rub frozen parts as tissue damage may result. As soon as practical, place the affected area in a warm water bath which has a temperature not exceeding 105 °F (40°C). Never use dry heat. In case of massive exposure, remove clothing while showering with warm water. Call a physician as soon as possible.

Frozen tissue is painless and appears waxy with a possible yellow color. It will become swollen, painful, and prone to infection when thawed. If the frozen part of the body has been thawed by the time medical attention has been obtained, cover the area with dry sterile dressing with a large bulky protective covering.

**INGESTION:** Not applicable

**NOTES TO PHYSICIAN:** None

#### 5. FIREFIGHTING MEASURES

**FLAMMABLE PROPERTIES:** Nonflammable and does not support combustion.

**EXTINGUISHING MEDIA:** Use extinguishing media appropriate for the surrounding fire.

**PROTECTION OF FIREFIGHTERS:**

**SPECIFIC HAZARDS ARISING FROM THE CHEMICAL:** When spilled the liquid will vaporize rapidly forming an oxygen-deficient vapor cloud. Evacuate this vapor cloud area. Visibility may be obscured in the vapor cloud. Pressure in a container can build up due to heat and it may rupture if pressure relief devices should fail to function. Contact with cold liquid or gas may cause frostbite.

**PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIREFIGHTERS:** Simple asphyxiant. If possible, remove containers from fire area or cool with water. Do not direct water spray at the container vent. Self contained breathing apparatus may be required for rescue workers. Evacuate this area.

**SENSITIVITY TO STATIC DISCHARGE:** Not Applicable

**SENSITIVITY TO MECHANICAL IMPACT:** None

#### 6. ACCIDENTAL RELEASE MEASURES

**PERSONAL PRECAUTIONS:** Use personal protection recommended in Section 8. Evacuate all personnel from the affected area. Ventilate area or remove containers to a well ventilated location. To increase rate of vaporization, spray large amounts of water onto the spill from an upwind position. If leaking from container or its valve, contact your supplier.

**ENVIRONMENTAL PRECAUTIONS:** Not applicable.

**METHODS FOR CONTAINMENT:** Shut off source if possible without risk.

**METHODS FOR CLEAN-UP:** Not applicable.

**OTHER INFORMATION:** None.

## 7. HANDLING AND STORAGE

**HANDLING:** Never allow any unprotected part of the body to touch un-insulated pipes or vessels that contain cryogenic fluids. The extremely cold metal will cause the flesh to stick fast and tear when one attempts to withdraw from it.

Use a suitable four-wheel hand truck for container movement. Cryogenic containers shall be handled and stored in an upright position. Do not drop or roll containers on their sides. If user experiences any difficulty operating container valve discontinue use and contact supplier. For additional precautions see Section 16, Other Information.

**STORAGE:** Store and use with adequate ventilation. Compressed gas cylinders shall be separated from materials and conditions that present exposure hazards to or from each other. Do not store in a confined space. Cryogenic containers are equipped with pressure relief devices to control internal pressure. Under normal conditions these containers will periodically vent product. Some metals such as carbon steel may become brittle at low temperatures and will easily fracture. Prevent entrapment of liquid in closed systems or piping without pressure relief.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**EXPOSURE GUIDELINES:**

OSHA PEL-TWA: None

NIOSH IDLH: None

ACGIH TLV: Simple asphyxiant

**ENGINEERING CONTROLS:**

**VENTILATION:** Natural or mechanical to prevent oxygen-deficient atmospheres below 19.5% oxygen.

**PERSONAL PROTECTIVE EQUIPMENT:**

**EYE/FACE PROTECTION:** Full face shield and safety glasses are recommended.

**SKIN PROTECTION:** Loose fitting thermal insulated or leather gloves. Safety shoes are recommended when handling liquid containers. Long sleeve shirts and trousers without cuffs.

**RESPIRATORY PROTECTION (SPECIFY TYPE):**

General Use: None required

Emergency Use: Self-contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmosphere. Air purifying respirators will not function.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless  
ODOR: Odorless  
ODOR THRESHOLD: Not applicable  
PHYSICAL STATE: Cryogenic liquid  
pH: Not applicable

MELTING POINT: -345.8 °F (-209.9 °C) @ 1 atm  
BOILING POINT: -320.4 °F (-195.8 °C) @ 1 atm  
FLASH POINT: Not applicable  
EVAPORATION RATE (Butyl Acetate=1): Not applicable  
FLAMMABILITY: Nonflammable

FLAMMABLE LIMITS IN AIR BY VOLUME:  
LOWER: Not applicable; UPPER: Not applicable

VAPOR PRESSURE (AT 20 °C): Not applicable  
GAS DENSITY: 0.072 lb/ft<sup>3</sup> (1.153 kg/m<sup>3</sup>) @ 70 of (21.1 °C) and 1 atm  
SPECIFIC GRAVITY (Air =1): 0.967 @ 70 °F (21.1 °C) and 1 atm  
SOLUBILITY IN WATER: Vol/Vol at 32 °F (0 °C): 0.023  
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available  
AUTOIGNITION: Nonflammable  
DECOMPOSITION TEMPERATURE: Not applicable  
MOLECULAR WEIGHT: 28.01  
EXPANSION RATIO: (for liquid to gas) 70 °F (21.1 °C): 1 to 696.5

## 10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable  
CONDITIONS TO AVOID: None  
INCOMPATIBLE MATERIALS: None  
HAZARDOUS DECOMPOSITION PRODUCTS: None  
POSSIBILITY OF HAZARDOUS REACTIONS: Will not occur

## 11. TOXICOLOGICAL INFORMATION

The product is simple asphyxiant.  
ACUTE DOSE EFFECTS: LD<sub>50</sub>: None LC<sub>50</sub>: None  
REPEATED DOSE EFFECTS: None established  
IRRITATION: None  
SENSITIZATION: None

GENETIC EFFECTS: None  
DEVELOPMENTAL EFFECTS: None  
TERATOGENICITY: None  
SYNERGISTIC MATERIALS: None  
REPRODUCTIVE EFFECTS: None  
TARGET ORGAN EFFECTS: None

MUTAGENICITY: None

## 12. ECOLOGICAL INFORMATION

ECOTOXICITY: No adverse ecological effects are expected. It does not contain any Class I or Class II ozone depleting chemicals (40 CFR Part 82). Not listed as a marine pollutant by DOT (49 CFR Part 171).

## 13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Contact your supplier.  
For emergency disposal, discharge slowly to the atmosphere in a well ventilated area or outdoors.

## 14. TRANSPORT INFORMATION

Product Identification Number: 1977

BASIC SHIPPING DESCRIPTION:

PROPER SHIPPING NAME: Nitrogen, refrigerated liquid

HAZARD CLASS: 2.2 (Nonflammable Gas)

IDENTIFICATION NUMBER: UN 1977

ADDITIONAL INFORMATION:

PRODUCT RQ: Not applicable

SHIPPING LABEL(s): Nonflammable gas

PLACARD (When required): Nonflammable gas

SPECIAL SHIPPING INFORMATION: Containers should be transported in a secure position, in a well ventilated vehicle. The transportation of compressed gas containers in automobiles or in closed-body vehicles can present serious safety hazards and should be discouraged. For air shipments, the "Cryogenic Liquid" handling label must be used in addition to the nonflammable gas (Division 2.2) hazard label on packages and over packs containing cryogenic liquids.

## 15. REGULATORY INFORMATION & OTHER INFORMATION

SPECIAL PRECAUTIONS: Use piping and equipment adequately designed to withstand pressures and temperatures to be encountered. Use a check valve or other protective apparatus in any line or piping from the container to prevent reverse flow. Cross contamination of gases, liquids, or both can also create a hazardous condition inside a cylinder, dewar, or vessel (e.g., flammable and oxidizing gases can create an explosive mixture), which may result in rupture. To prevent cryogenic liquids or cold gas from being trapped in piping between valves the piping shall be equipped with pressure relief devices. Only transfer lines designed for cryogenic liquids shall be used. It is recommended that all vents be piped to the exterior of the building.

Shipment of compressed gas containers that have not been filled with the owner's consent is a violation of Federal law (49 CFR Part 173.301.b)

HAZARD RATINGS AND RATING SYSTEMS:

NFPA RATINGS:

MATERIAL SAFETY DATA SHEET - "LIQUID NITROGEN"

HEALTH: =3; FLAMMABILITY: =0; INSTABILITY: =0; SPECIAL: SA

**STANDARD VALVE CONNECTIONS:**

THREADED: CGA 295

PIN-INDEXED YOKE: Not applicable

ULTRA HIGH INTEGRITY: Not applicable

Use the proper connections; DO NOT USE ADAPTERS. DO NOT FORCE FIT CONNECTIONS.

The information and recommendations in this Material Safety Data Sheet relate only to the specific material mentioned herein and do not relate to use otherwise ie., in combination with any other material or in any process.

The information and recommendations herein are taken from our extensive experiences and the data contained in recognized references and believed by us to be accurate. Refrigeration group of companies make no warranties either expressed or implied with respect there to and assume no liability in connection with the use of such information and recommendation.