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: N₂
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; 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 ºC) @ 1 atm
BOILING POINT: -320.4 °F (-195.8 ºC) @ 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 ºC): Not applicable
GAS DENSITY: 0.072 lb/ft³ (1.153 kg/m³) @ 70 of (21.1 ºC) and 1 atm
SPECIFIC GRAVITY (Air =1): 0.967 @ 70 ºF (21.1 ºC) and 1 atm
SOLUBILITY IN WATER: Vol/Vol at 32 ºF (0 ºC): 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 ºC): 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: LD₅₀: None        LC₅₀: 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:
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 i.e., 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.