



Nitrogen, Refrigerated Liquid

Safety Data Sheet

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

Product identifier

Product Name NITROGEN, REFRIGERATED, LIQUID

Other means of identification

Safety data sheet number SDS-YO-013

UN/ID no. UN1977

Trade name Nitrogen Liquid, Nitrogen HP-N4.8, Nitrogen CP-N5.5, Nitrogen Commercial N3

Recommended use of the chemical and restrictions on use

Recommended Use Industrial and professional

use. Uses advised against Consumer use

Details of the supplier of the safety data sheet

Yateem Oxygen W.L.L

P.O. Box 60, Manama, Bahrain

Email: wecare@yateemoxygen.com

Website: www.yateemoxygen.com

Customer Service: +973 17400677

Emergency telephone number

Company Phone Number +973 17400456,

Emergency Contact Number +17400675, +973 17456248

SECTION 2: Hazards identification

Classification

OSHA Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

Gases under pressure	Refrigerated Liquefied Gas
Simple asphyxiants	Yes

Label elements

Signal word

Warning

Hazard Statements

Contains refrigerated gas; may cause cryogenic burns or injury

May displace oxygen and cause rapid suffocation



Precautionary Statements - Prevention

Do not handle until all safety precautions have been read and understood

Use and store only outdoors or in a well-ventilated place

Wear cold insulating gloves, face shield, and eye protection

Use a backflow preventive device in piping

Do NOT change or force fit connections. Close valve after each use and when empty Always keep container in upright position

Precautionary Statements - Response

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical attention/advice.

IF ON SKIN: Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.

Hazards not otherwise classified (HNOC)

Not applicable

SECTION 3: Composition/information on ingredients

Chemical Name	CAS No.	Volume %	Chemical Formula
NITROGEN	7727-37-9	>99	N ₂

SECTION 4: First aid measures

Description of first aid measures

General advice	Show this safety data sheet to the doctor in attendance.
Inhalation	Remove to fresh air and keep comfortable for breathing. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get medical attention immediately.
Skin contact	For dermal contact or suspected frostbite, remove contaminated clothing and flush affected areas with lukewarm water. DO NOT USE HOT WATER. A physician should see the patient promptly if contact with the product has resulted in blistering of the dermal surface or in deep tissue freezing
Eye contact	If frostbite is suspected, flush eyes with cool water for 15 minutes and obtain immediate medical attention
Ingestion	Not an expected route of exposure.
Self-protection of the first aider	RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

Most important symptoms and effects, both acute and delayed

Symptoms	Simple asphyxiant. May cause suffocation by displacing the oxygen in the 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 8-10% 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. Contact with evaporating liquid may cause cold burns/frostbite
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Indication of any immediate medical attention and special treatment needed

Note to physicians	Treat symptomatically.
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SECTION 5: Firefighting measures

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media None.

Specific extinguishing methods

Continue to cool fire exposed cylinders until flames are extinguished. Damaged cylinders should be handled only by specialists.

Specific hazards arising from the chemical

Non-flammable gas. -Cylinders may rupture under extreme heat.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, NIOSH (approved or equivalent) and full protective gear.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions	Evacuate personnel to safe areas. Ensure adequate ventilation, especially in confined areas. Monitor oxygen level. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Use personal protection recommended in Section 8.
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Other Information When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.

Environmental precautions

Environmental precautions Prevent spreading of vapors through sewers, ventilation systems and confined areas.

Methods and material for containment and cleaning up

Methods for containment Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. If leak is in container or container valve, contact the appropriate emergency telephone number in Section-1 or call your closest Yateem Oxygen location.

Methods for cleaning up Return portable cryogenic container to Yateem Oxygen

SECTION 7. Handling and Storage

Precautions for safe handling

Advice on safe handling

Never allow any unprotected part of the body to touch uninsulated pipes or vessels that contain cold fluids. The extremely cold metal will cause moist flesh to stick fast and tear when one attempts to withdraw from it. Do NOT change or force fit connections.

Liquid nitrogen is delivered into stationary vacuum jacketed vessels at the customer's location or in portable vacuum-jacketed "liquid" cylinders requiring special handling methods. Consult manufacturer's instructions.

Due to the extremely cold liquid, uninsulated transfer may condense air. The liquefied air may flash off nitrogen, leaving an oxygen enriched liquid. Do not allow the liquefied air to contact oils, grease, or other combustible materials such as asphalt or motor oil. Vessels for liquid nitrogen are designed specifically for nitrogen service. Vessels and associated structures are not designed to support higher density fluids. Density, liquid at saturation pressure at 2.17°K (-271°C): 0.146 Kg/l.

Protect cylinders from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distance, use a cart designed to transport cylinders. Never attempt to lift a cylinder by its valve protection cap. Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing leak to occur. Use an adjustable strap wrench to remove over-tight or rusted caps. Use only with adequate ventilation. Use a backflow preventive device in piping. Close valve after each use and when empty. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Ensure the complete gas system has been checked for leaks before use.

Never put cylinders into trunks of cars or unventilated areas of passenger vehicles. Never attempt to refill a compressed gas cylinder without the owner's written consent. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit.

Only experienced and properly instructed persons should handle gases under pressure. Always store and handle compressed gas cylinders in accordance with Compressed Gas Association, pamphlet CGA-P1, Safe Handling of Compressed Gases in Containers. Use only with equipment rated for cylinder pressure.

For additional recommendations consult Compressed Gas Association's (CGA) Pamphlets, AV-8, CGA-341, G-10.1, P-, P-9, P-12, P-14, and P-18.

Conditions for safe storage, including any incompatibilities

Storage Conditions

Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Keep at temperatures below 52°C / 125°F. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders from being stored for excessive periods of time. Stored containers should be periodically checked for general condition and leakage.

Incompatible materials

None known.

SECTION 8: Exposure controls/personal protection

Control parameters

Exposure Guidelines

Chemical Name	ACGIH	OSHA PEL	NIOSH IDLH
NITROGEN 7727-37-9	See Appendix F: Minimal Oxygen	None	None

Appropriate engineering controls

Engineering Controls Ventilation systems. Local exhaust ventilation to prevent accumulation of high concentrations and maintain air-oxygen levels at or above 19.5%. Oxygen detectors should be used when asphyxiating gases may be released. Showers. Eyewash stations.

Individual protection measures, such as personal protective equipment

Eye/face protection Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes. Wear eye protection to EN 166 when using gases.
Guideline: EN 166 Personal Eye Protection.

Skin and body protection Work gloves and safety shoes are recommended when handling cylinders. Wear cold insulating gloves when handling liquid

Respiratory protection Not required on normal use.

Emergency responders shall use SCBA and monitor oxygen level <19.5%.

Thermal hazards: If there is a risk of contact with the liquid, all protective equipment should be suitable for extremely low temperatures.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice. Do not get in eyes, on skin, or on clothing.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Physical state	Gas
Form	Refrigerated Liquified Gas
Appearance	Colorless.
Odor	Odorless.
Odor threshold	Not applicable
pH	Not applicable
Melting/freezing point	-209.9 °C / -345.9 °F
Evaporation rate	Not applicable
Flammability (solid, gas)	Non-flammable gas
Lower flammability limit:	Not applicable
Upper flammability limit:	Not applicable
Flash point	Not applicable
Autoignition temperature	No data available
Decomposition temperature	No data available
Water solubility	20 mg/l
Partition coefficient (n-octanol/water)	0.67
Kinematic viscosity	Not applicable
Dynamic viscosity	0.171 MpA.S (10.9 °C)

Chemical Name	Molecular weight	Boiling point / range	Vapor Pressure	Vapor density (air =1)	Gas Density kg/m ³ @20°C	Critical Temperature
NITROGEN	28.01 g/mol	-196 °C	Above critical temperature	0.97	1.153	-146.9 °C

Other Information: Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level

SECTION 10: Stability and Reactivity

Reactivity

Not reactive under normal conditions

Chemical stability

Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None.

Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to avoid

None under recommended storage and handling conditions (see Section 7).

Incompatible materials

None Known

Hazardous Decomposition Products

None Known

SECTION 11: Toxicological Information

Information on likely routes of exposure

Inhalation	Product is a simple asphyxiant.
Skin contact	Contact with evaporating liquid may cause cold burns/frostbite
Eye contact	Contact with evaporating liquid may cause cold burns/frostbite
Ingestion	Not an expected route of exposure.

Information on toxicological effects

Symptoms	Simple asphyxiant. May cause suffocation by displacing the oxygen in the 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 8-10% 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.
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Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation	Not classified.
Serious eye damage/eye irritation	Not classified.
Irritation	Not classified.
Sensitization	Not classified.
Germ cell mutagenicity	Not classified.
Carcinogenicity	It does not contain any carcinogens or potential carcinogens listed by OSHA, IARC or NTP.
Reproductive toxicity	Not classified.
Developmental Toxicity	Not classified.
STOT - single exposure	Not classified.
STOT - repeated exposure	Not classified.
Chronic toxicity	None known.
Aspiration hazard	Not applicable.

Numerical measures of toxicity

Oral LD50	No information available
Dermal LD50	No information available
Inhalation LC50	No information available

SECTION 12: Ecological Information

Ecotoxicity

No known acute aquatic toxicity.

Persistence and degradability

Not applicable.

Bioaccumulation

No information available

Other adverse effects

Can cause frost damage to vegetation

SECTION 13. Disposal Considerations

Waste treatment methods

Disposal of wastes	Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to Yateem Oxygen for proper disposal.
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SECTION 14. Transportation Information

DOT

UN/ID no.	Regulated, UN1977
Proper shipping name	Nitrogen, Refrigerated Liquid
Hazard Class	2.2
Special Provision	T75, TP5, 346, 345
Description	UN1977, Nitrogen, refrigerated liquid, 2.2
Emergency response guide	120

TDG

UN/ID no.	UN1977
Proper shipping name	Nitrogen, Refrigerated Liquid
Hazard Class	2.2

IATA

UN/ID no.	UN1977
Proper shipping name	Nitrogen, Refrigerated Liquid
Hazard Class	2.2
Label	2.2, 74C

IMDG

UN/ID no.	UN1977
Proper shipping name	Nitrogen, Refrigerated Liquid
Hazard Class	2.2
EmS-No.	F-C, S-V

SECTION 15. Regulatory Information

National Legislation Complies

SEC <https://www.sce.gov.bh/en/index>
MTT <http://www.transportation.gov.bh/content/caa-laws-and-regulations>
OHSC <http://www.scosh.org/en/legislation/legislations#legislationContainer>

International Inventories

TSC Complies
DSL/NDSL Complies
EINECS/ELINCS Complies

Legend

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

SEC – Specific Council of Environment

MTT – Ministry of Transport and Telecommunications

OHSC - Occupational Health and Safety Council

SECTION 16: Other Information

<u>NFPA</u>	Health hazards 0	Flammability 0	Instability 0	Physical and Chemical Properties Simple asphyxiant
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Note: Ratings were assigned in accordance with Compressed Gas Association (CGA) guidelines as published in CGA Pamphlet P-19-2009, CGA Recommended Hazard Ratings for Compressed Gases, 3rd Edition.

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End of Safety Data Sheet