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MATERIAL SAFETY DATA SHEET

Product Name:

**NITROGEN,
Refrigerated Liquid (N₂)**

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IDENTIFICATION

Chemical Name: Nitrogen (N₂)
Synonyms: LIN
UN Number: 1977

Use: Inert gas widely used in chemical, food and beverage, petrochemical and metal industries.

HAZARDS IDENTIFICATION

Dangerous Goods Class and Subsidiary Risk: 2.2

HSNO Classification: Not Hazardous

Hazard Statement: Contains refrigerated gas; may cause cryogenic burns or injury.

Precautionary Statements: Read label before use.
Read Material Safety Data Sheets.
Wear full body protection
Wear cold insulating gloves, face shield and eye protection.
Cold burns: Thaw frosted parts with lukewarm water. Do not rub affected area.
Get immediate medical advice/attention.
Store in a well ventilated place.
Product is a simple asphyxiant.

COMPOSITION

Ingredients	CAS Number	Proportion
Chemical Entity		
Nitrogen	7727-37-9	100%

Contains no other components or impurities that will influence the classification of the product.

FIRST AID MEASURES**Health Effects****Acute**

Swallowed: Can cause cold burn if swallowed.
Eye: Can cause severe cold burn if brought in contact with eye.
Skin: Can cause severe cold burn if brought in contact with skin.

Inhaled: Nitrogen is non-toxic. When nitrogen evaporates, it can dilute the oxygen concentration in air below the level necessary to support life; it can act as an asphyxiant. Effects of oxygen deficiency are:

- 16%: breathing and pulse rate increased, impaired thinking and attention, reduced coordination;
- 14%: Abnormal fatigue upon exertion, emotional upset, faulty coordination, poor judgement;
- 12.5%: Very poor judgement and coordination, impaired respiration that can cause permanent hearing damage, nausea and vomiting;
- below 10%: Inability to perform various movements, loss of consciousness, convulsions, and death.

Chronic

Long term exposure to nitrogen has no known health effects. Prolonged exposure to an oxygen deficient atmosphere (below 18% oxygen in air) may affect the heart and nervous system. Exposure to liquid nitrogen can result in cold burns, which need immediate medical attention. Frozen tissue can die (frostbite).

First AidInhalation:

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Remove victim to uncontaminated area whilst wearing self contained breathing apparatus. Victim may not be aware of asphyxiation. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped. Continued treatment should be symptomatic and supportive.

Swallowed:

Seek medical attention immediately. Drink large quantities of water (not hot) to help thaw affected areas.

Eye Contact

Immediately flush eyes thoroughly with unheated tap water for at least 15 minutes. Obtain medical assistance.

Skin Contact

Liquid nitrogen can cause severe cold burn upon contact with skin.

- In case of cold burn move the victim to a warm place (about 22°C) but do not apply direct heat. Never use dry heat.
- Do not rub frozen parts, as tissue damage may result.
- Gently, flush the affected areas of the skin with large quantities of unheated tap water. Do not use hot water or any other form of direct heat.
- The skin should gradually change colour, via blue, back to pink.
- Loosen any clothing that might restrict the circulation to the affected area but take care not to remove any clothing frozen to flesh.
- Apply DRY, sterile, non-adhering dressing with a large bulky protective covering to protect the wounds
- Do not apply dry sterile dressing too tightly in case it restricts blood circulation. Keep the affected body part at rest. It will become swollen, painful and prone to infection when thawed.
- Treat the person for shock.
- Do not give person alcohol to drink or tobacco to smoke. Both will restrict blood flow to the wound and retard recovery.
- Obtain medical assistance immediately.

Advice to Doctor

The thawing process, depending on the degree of exposure, can be painful and it can be necessary to administer drugs to control pain.

Thawing takes from 15 – 60 minutes.

Administer a tetanus booster after hospitalisation.

Advise doctor that victim has been exposed to an oxygen deficient atmosphere. Specialist advice for treatment of cryogenic burns is available at a Burns Unit.

General:

Low air temperature due to close proximity of liquefied atmosphere gases can cause hypothermia and all persons at risk should be warmly clad. Avoid liquid spillage as cryogenic liquids embrittle many materials on contact.

When liquid nitrogen evaporates, it can dilute the oxygen concentration in the air. Rescuers should not enter an oxygen deficient atmosphere without using self-contained full face positive pressure breathing equipment.

FIRE FIGHTING MEASURES**Flammability:**

Non Flammable.

Fire/Explosion Hazard:

Exposure to fire may cause container to rupture/explode. Nitrogen is non-flammable, but container may release large quantities of nitrogen if ruptured. Nitrogen may serve to extinguish fire.

Extinguishing Media:

Use appropriate media to extinguish source of surrounding fire.

Hazchem Code:

2T

Recommended Protective Clothing:

A full chemical protection suit and breathing apparatus should be worn.

Thermal protection from cryogenic temperatures required.

ACCIDENTAL RELEASE MEASURES**Personal Protection:**

Personnel handling liquid nitrogen shall be provided with full overalls, safety footwear, safety glasses and cryogenic gloves. In areas where equipment failure may cause an immediate high concentration of nitrogen, ensure adequate ventilation and have approved self-contained, full face respiratory equipment readily available for emergencies.

Spills and Disposal:

Ventilate area. Stop leak if it can be done without risk. Allow gas to dissipate to atmosphere. Cold vapours are heavier than air. In case of large spillage evacuate nearby trenches, excavations, pits and the like.

Reference Guide:

Standard SNZ HB 76:2008 Dangerous Goods – Initial Emergency Response Guide.

AS/NZS 1337 – Eye Protection for Industrial Applications

AS/NZS 2161.1 – Occupational Protective Gloves – Selection, use and maintenance

AS/NZS 1715 – Selection, Use and Maintenance of Respiratory Protective Devices

AS/NZS 1716 – Respiratory Protective Devices

General:

Low air temperature due to close proximity of liquefied atmosphere gases can cause hypothermia and all persons at risk should be warmly clad. Avoid liquid spillage as cryogenic liquids embrittle many materials on contact.

Only experienced and properly instructed personnel should handle liquefied gases.

HANDLING AND STORAGE**Handling****Flammability:**

Non Flammable.

General:

Low air temperature due to close proximity of liquefied atmosphere gases can cause hypothermia and all persons at risk should be warmly clad. Avoid liquid spillage as cryogenic liquids embrittle many materials on contact. Only experienced and properly instructed personnel should handle liquefied gases.

Approved Handlers:

Approved handlers are not required, non hazardous gas (HSNO).

Approved Fillers:

Approved fillers are required when transferring liquid nitrogen to other storage containers.

Storage:

Keep container below 50°C in a well ventilated place.

Supplied in portable cryogenic liquid containers or by bulk road tanker to cryogenic storage vessels installed at users' premises.

Separation:

Avoid any contact with oil or grease particularly to the vessel valves.

Nitrogen can be stored with most common substances.

Spills and Disposal:

Ventilate area. Stop leak if it can be done without risk. Allow gas to dissipate to atmosphere. Cold vapours are heavier than air. In case of large spillage evacuate nearby trenches, excavations, pits and the like.

EXPOSURE CONTROLS / PERSONAL PROTECTION**Exposure Standards:**

Nitrogen is a simple asphyxiant. Liquid nitrogen is extremely cold and can cause cold burns.

Engineering Controls:

Provide adequate local exhaust and dilution (general) ventilation and supply sufficient replacement air to maintain oxygen concentration above 19%. Cryogenic liquids embrittle many materials on contact. Thermal insulation of components in direct contact with liquid nitrogen.

Personal Protection:

Personnel handling liquid nitrogen shall be provided with full overalls, safety footwear, safety glasses and leather or PVC gloves. In areas where equipment failure may cause an immediate high concentration of nitrogen, ensure adequate ventilation and have approved self-contained, full face respiratory equipment readily available for emergencies.

Reference Guide:

AS/NZS 1337 – Eye Protection for Industrial Applications

AS/NZS 2161.1 – Occupational Protective Gloves – Selection, use and maintenance

AS/NZS 1715 – Selection, Use and Maintenance of Respiratory Protective Devices

AS/NZS 1716 – Respiratory Protective Devices

PHYSICAL AND CHEMICAL PROPERTIES**Physical Properties**

Appearance:	Colourless, odourless, tasteless	Flashpoint:	non flammable
Boiling Point:	-195.8°C	Flammability Limits:	non flammable
Vapour Pressure:	Not applicable	Solubility in Water (at 0°C):	0.0235 m ³ /kg

Other Properties

Relative Density (at 15°C) (Air = 1):	0.967	Density of Liquid (B.P.):	808.6 kg/m ³
Molecular Weight:	28.013	Critical Temperature:	-146.95°C

STABILITY AND REACTIVITY**Flammability:**

Non Flammable. Contains refrigerated gas; may cause cryogenic burns or injury

Materials Compatibility:

Stable under normal conditions. Liquid spillages can cause embrittlement of structural materials.

TOXICOLOGY INFORMATION

No known toxicological effects from this product.

ECOLOGICAL INFORMATION

Can cause frost damage to vegetation.

DISPOSAL CONSIDERATIONS

Do not discharge into any place where its accumulation could be dangerous.

TRANSPORT INFORMATION

UN Number:	1977
Proper Shipping Name:	NITROGEN, REFRIGERATED LIQUID
Dangerous Goods Class and Subsidiary Risk:	2.2
Packing Group:	Not applicable
Hazchem Code:	2T
Other Information:	Avoid transport on vehicles where the load is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: <ul style="list-style-type: none">• Ensure that containers are firmly secured.• Ensure valves are closed and not leaking.• Ensure there is adequate ventilation.• Compliance with applicable regulations.

REGULATORY INFORMATION

ERMA Register Approval No: HSR001027

HSNO Controls: Hazardous Substances (Compressed Gases) Regulations 2004.
Hazardous Substances (Tank Wagon and Transportable Containers) Regulations 2004

Approved Handlers: Approved handlers are not required, non hazardous gas (HSNO).

Approved Fillers: Approved fillers are required when transferring liquid nitrogen to other storage containers.

OTHER INFORMATION

- References:
- . L'Air Liquide Gaz Encyclopaedia - Elsevier Scientific Publishing Co. Amsterdam
 - . NZS 5433:2007 Transport of Dangerous Goods on Land
 - . ERMA Website – Approvals Register – www.erma.govt.nz
 - . SNZ HB76:2008 Dangerous Goods – Initial Emergency Response Guide
 - . Air Liquide Group MSDS – Nitrogen (Refrigerated) AL089B Rev. 1
 - . Air Liquide Australia "Nitrogen, Refrigerated Liquid" MSDS June 2008
 - . AS1678 2C1 Emergency Procedure Guide – Transport – Non-Flammable, Compressed Gas
 - . CGA Safety bulletin SB2-2007 Oxygen Deficiency
 - . Operators Handbook for the Transport of Dangerous Goods by Road – NZ Road Transport & Logistics Industry Training Organisation
 - . ALNZ - Transport of Gas cylinders in Non-Dedicated Vehicles Customer Information Guide
 - . AS1894 The Storage and Handling of Non-Flammable Cryogenic and Refrigerated Liquids – Appendix G
 - . NZCIC Code of Practice – Preparation of Safety Data Sheets

END MSDS

This MSDS summarises to our best knowledge, at the date of issue, the health and safety hazard information regarding this product and general guidance on how to safely handle the product in the workplace. All due care has been taken to include accurate and up-to-date information in this MSDS.

Each user should read this MSDS and consider the information in the context of how the product will be handled and used in the workplace in conjunction with other products. If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact Air Liquide New Zealand.

As far as lawfully possible, no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this MSDS can be accepted.

Our responsibility for products sold is subject to our standard terms and conditions, a copy of which is available on request.

This MSDS has been prepared in accordance with NZCIC Code of Practice – Preparation of Safety Data Sheets.

This MSDS is subject to change without notice. For the latest version of this MSDS visit <http://www.airliquide.com.au/en/technical/new-zealand-msds.html>

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