LIQUID NITROGEN HANDLING & SAFETY SHEET

Compliant with RACGP Standards for General Practices (6th Edition), AS 1894:1997, and Safe Work Australia Guidelines.

1. PURPOSE & SCOPE

- Provide a clear practice-level protocol for safe handling, storage, and emergency response for liquid nitrogen (LN_2).
- Meets RACGP Standards 6th Edition requirements for clinical safety, risk management, and staff training.

2. RESPONSIBILITIES & GOVERNANCE

- Practice Owner / GP Lead – ensures resources, training, oversight, and compliance with WHS legislation.
- Practice Nurse Manager – maintains SDS, signage, equipment audits, and incident reporting.
- Clinical Staff / Operators – follow procedure, wear PPE, report hazards, participate in training.
- All Staff / Visitors – comply with posted warnings and report any spills or concerns.

3. HAZARD SUMMARY

- Cryogenic burns or frostbite from contact with LN_2 or cold metal.
- Asphyxiation risk due to oxygen displacement in confined areas.
- Pressure build-up if sealed or damaged vessels are used.
- Splashes and spillage hazards during transfer or pouring.

4. PERSONAL PROTECTIVE EQUIPMENT (PPE)

- Gloves (insulated, loose-fitting).
- Full face shield or safety goggles.
- Long-sleeved coat.
- Closed, non-slip shoes.
- Long trousers with no exposed skin.

5. EQUIPMENT & CONTAINERS

- Use only certified Dewar flasks or cryogenic vessels with loose-fitting caps.
- Label all vessels clearly: ‘Liquid Nitrogen’ – Cryogenic Hazard’.
- Inspect regularly for damage, frost, cracks, or leaks.
- Ensure vent paths are clear and unobstructed.

6. PROCEDURE FOR USE / DISPENSING

1. Confirm adequate ventilation and clear work area.
2. Wear required PPE before handling.
3. Place vessel upright on a stable surface.
4. Pour slowly to avoid splashing; do not overfill.
5. Replace lid loosely after dispensing.

7. STORAGE & TRANSPORTATION

- Store LN_2 in a cool, dry, ventilated area, upright and secured.
- Display hazard signage: ‘Cryogenic Hazard’; and ‘Asphyxiation Risk’.
- Do not store in confined areas.
- Transport only in approved vessels, upright, and never sealed.

8. EMERGENCY RESPONSE & FIRST AID

- Cold burn/frostbite: remove exposure, immerse in lukewarm water, seek medical
- attention.
- Eye splash: rinse for 15 minutes with water, urgent medical review.
- Asphyxiation: move to fresh air, call 000, perform CPR if needed.
- Large spill: evacuate, ventilate naturally, notify safety officer.

9. TRAINING & COMPETENCY

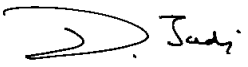
- All staff handling LN_2 must complete formal training and assessment.
- Maintain current training records and refresh annually.
- Include LN_2 handling in practice risk management and safety reviews.

10. AUDIT, REVIEW & CONTINUOUS IMPROVEMENT

- Monthly equipment and signage checks.
- Yearly procedure audits and incident review.
- Annual review of training status and this protocol.
- Encourage near-miss reporting and staff feedback.

11. REFERENCES & STANDARDS

- RACGP Standards for General Practices (6th Edition).
- AS 1894:1997 – Storage & Handling of Non-Flammable Cryogenic Liquids.
- Safe Work Australia – Managing Risks of Hazardous Chemicals.
- Supplier safety information (BOC, Air Liquide Australia).

Approved by:  **Date:** 9.10.2025 **Next Review:** 9.10.2026

BOC
A Member of The Linde Group

SAFETY DATA SHEET

 # 071

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name **LIQUID NITROGEN**

Synonyms 071 - SDS NUMBER ● 709, 712, 716 ● NITROGEN (LIQUEFIED) (FORMERLY) ● PRODUCT CODES: 701, 702, 703, 704, 705, 706, 707, 708, 719

1.2 Uses and uses advised against

Uses CRYOGEN ● FREEZING APPLICATIONS ● HEAT TRANSFER MEDIUM ● INERT GAS ● LOW TEMPERATURE APPLICATIONS ● PURGING ● SEMICONDUCTORS

1.3 Details of the supplier of the product

Supplier name **BOC LIMITED (AUSTRALIA)**

Address 10 Julius Avenue, North Ryde, NSW, 2113, AUSTRALIA

Telephone 131 262, (02) 8874 4400

Fax 132 427 (24 hours)

Website http://www.boc.com.au

1.4 Emergency telephone numbers

Emergency 1800 653 572 (24/7) (Australia only)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

Physical Hazards

Gases Under Pressure: Refrigerated liquefied gas

Health Hazards

Not classified as a Health Hazard

Environmental Hazards

Not classified as an Environmental Hazard

2.2 GHS Label elements

Signal word **WARNING**

Pictograms

Hazard statements

H281 Contains refrigerated gas; may cause cryogenic burns or injury.

Prevention statements

P282 Wear cold insulating gloves and either face shield or eye protection.

Response statements

P336 + P315 Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.

Storage statements

P403 Store in a well-ventilated place.

Disposal statements

None allocated.

2.3 Other hazards

Asphyxiant. Effects are proportional to oxygen displacement.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content (v/v)
NITROGEN	7727-37-9	231-783-9	>99.9%

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye Cold burns: Immediately flush with tepid water or with sterile saline solution. Hold eyelids apart and irrigate for 15 minutes. Seek medical attention.

Inhalation If inhaled, remove from contaminated area. To protect rescuer, use an Air-line respirator or Self Contained Breathing Apparatus (SCBA). Apply artificial respiration if not breathing. Give oxygen if available. For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor.

Skin Cold burns: Remove contaminated clothing if not stuck to the skin. Gently flush affected areas with warm water (30°C) for 15 minutes. Apply sterile dressing and treat as for a thermal burn. For large burns, immerse in warm water for 15 minutes. DO NOT apply any form of direct heat. Seek immediate medical attention.

Ingestion Due to product form and application, ingestion is considered unlikely.

First aid facilities Eye wash facilities and safety shower should be available.

4.2 Most important symptoms and effects, both acute and delayed

In high concentrations may cause asphyxiation. Direct contact with the liquefied material or escaping compressed gas may cause frostbite injury.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Use water fog to cool containers from protected area.

5.2 Special hazards arising from the substance or mixture

Non flammable.

5.3 Advice for firefighters

Temperatures in a fire may cause cylinders to rupture. Cool cylinders or containers exposed to fire by applying water from a protected location. Remove cool cylinders from the path of the fire. Evacuate the area if unable to keep cylinders cool. Do not approach cylinders or containers suspected of being hot.

5.4 Hazchem code

2T

2 Fine Water Spray.

T Wear full fire kit and breathing apparatus. Dilute spill and run-off.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

If the cylinder is leaking, evacuate area of personnel. Inform manufacturer/supplier of leak. Use Personal Protective Equipment (PPE) as detailed in Section 8 of the SDS. Ventilate area where possible and eliminate ignition sources.

6.2 Environmental precautions
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

6.3 Methods of cleaning up
Stop the flow of material, if this is without risk. If the leak is irreparable, move the cylinder to a safe and well ventilated area, and allow to discharge. Keep area evacuated and free from ignition sources until any leaked or spilled liquid has evaporated.

6.4 Reference to other sections
See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities
Portable liquid container should be stored below 65°C in a secure area and upright to prevent from falling. Portable liquid containers should also be stored in a dry, well ventilated area constructed of non-combustible material with firm level floor (preferably concrete), away from areas of heavy traffic and emergency exits.

7.3 Specific end uses
No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters
Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m³	ppm	mg/m³
Nitrogen	SWA [AUS]	Asphyxiant			

Biological limits
No biological limit values have been entered for this product.

8.2 Exposure controls
Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical explosion proof extraction ventilation is recommended.

PPE

Eye / Face	Wear safety glasses.
Hands	Wear leather or insulated gloves.
Body	Wear coveralls.
Respiratory	Where an inhalation risk exists, wear Self Contained Breathing Apparatus (SCBA) or an Air-line respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	COLOURLESS LIQUID
Odour	ODOURLESS
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	-195.8°C
Melting point	NOT AVAILABLE
Evaporation rate	NOT APPLICABLE

9.1 Information on basic physical and chemical properties

pH	NOT APPLICABLE
Vapour density	NOT AVAILABLE
Relative density	NOT APPLICABLE
Solubility (water)	0.0149 cm^3 gas/cm^3
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

9.2 Other information

% Volatiles	100 %
Critical pressure	3400 kPa
Critical temperature	-146.9°C

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization will not occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Compatible with most commonly used materials.

10.6 Hazardous decomposition products

May evolve toxic gases if heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity	Based on available data, the classification criteria are not met.
Skin	Not classified as a skin irritant. Contact with the liquefied material or escaping compressed gas may cause frostbite injury.
Eye	Not classified as an eye irritant. Contact with the liquefied material or escaping compressed gas may cause frostbite injury.
Sensitisation	Not classified as causing skin or respiratory sensitisation.
Mutagenicity	Not classified as a mutagen.
Carcinogenicity	Not classified as a carcinogen.
Reproductive	Not classified as a reproductive toxin.
STOT - single exposure	Asphyxiant. Effects are proportional to oxygen displacement. Over exposure may result in dizziness, drowsiness, weakness, fatigue, breathing difficulties and unconsciousness.
STOT - repeated exposure	Not classified as causing organ damage from repeated exposure.
Aspiration	Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No information provided.

12.2 Persistence and degradability
No information provided.

12.3 Bioaccumulative potential
No information provided.

12.4 Mobility in soil
No information provided.

12.5 Other adverse effects
No ecological damage caused by this product. Nitrogen is the major component of the atmosphere (78 % v/v). It is a fairly unreactive gas and will not contribute to ozone depletion or global warming. If released to soil or water, nitrogen will quickly disperse to the atmosphere. Not toxic to plants or animals except at extremely high (asphyxiating) levels.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
Waste disposal Cylinders should be returned to the manufacturer or supplier for disposal of contents.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	1977	1977	1977
14.2 Proper Shipping Name	NITROGEN, REFRIGERATED LIQUID	NITROGEN, REFRIGERATED LIQUID	NITROGEN, REFRIGERATED LIQUID
14.3 Transport hazard class	2.2	2.2	2.2
14.4 Packing Group	None allocated.	None allocated.	None allocated.

14.5 Environmental hazards
No information provided.

14.6 Special precautions for user
Hazchem code 2T

GTEPG 2C3

EmS F-C, S-V

Other information Transport on open top vehicles in accordance with local legislation.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications Safe Work Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals (GHS Revision 7).

Inventory listings

AUSTRALIA: AIIC (Australian Inventory of Industrial Chemicals)
All components are listed on AIIC, or are exempt.

16. OTHER INFORMATION

Additional information

The storage of significant quantities of gas cylinders must comply with AS4332 The storage and handling of gases in cylinders.

APPLICATION METHOD: Specialised liquid distribution system. Vapourised liquid distributed through pressure and flow controlled distribution systems.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as form of product, method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:
It should be noted that the effects from exposure to this product will depend on several factors including: form of product; frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts 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 SDS.

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