

<b>MATERIAL SAFETY DATA SHEET</b>
Title: <b>LIQUID HELIUM MATERIAL SAFETY DATA SHEET</b>
Date of Issue: 1 August 2018
Date of Next Review: 1 August 2023

## MATERIAL SAFETY DATA SHEET HELIUM REFRIDGERATED LIQUID



### IDENTIFICATION:

**Chemical Name:** Helium

**Synonyms:** LHe, Liquid Helium

**UN Number:** 1963

**Use:** Inert gas widely used in chemical, scientific and medical industries.

### HAZARDS IDENTIFICATION:

**Dangerous Goods Class and Subsidiary Risk:** 2.2

**HSNO Classification:** Not Hazardous

**Hazard Statement:**

Refrigerated Liquid. May cause cryogenic burns or injury.

**Precautionary Statements:**

Read label before use.

Read Safety Data Sheet before use..

Wear full body protection

Wear cold insulating gloves/face shield/eye protection.

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.

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<b>MATERIAL SAFETY DATA SHEET</b>
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<b>COMPOSITION / INGREDIENTS:</b>
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<b>Chemical Entity</b>	<b>CAS Number</b>	<b>Proportion</b>
Helium	7440-59-7	100%

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

<b>FIRST AID MEASURES:</b>
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**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:** Helium is non-toxic. When helium 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 hear damage, nausea and vomiting;

**below 10%:** Inability to perform various movements, loss of consciousness, convulsions, and death.

**Chronic**

Long term exposure to helium has no known health effects. Prolonged exposure to an oxygen deficient atmosphere (below 19% oxygen in air) may affect the heart and nervous system.

Exposure to liquid helium can result in cold burns, which need immediate medical attention.

Frozen tissue can die (frostbite).

**First Aid**

**Inhalation:**

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.

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Reason for Amendment:	UPDATE	Revision Number:	REV 003	Page Number:	2

<b>MATERIAL SAFETY DATA SHEET</b>
Title: <b>LIQUID HELIUM MATERIAL SAFETY DATA SHEET</b>
Date of Issue: 1 August 2018
Date of Next Review: 1 August 2023

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 Helium 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.

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Reason for Amendment:	UPDATE	Revision Number:	REV 003	Page Number:	3

<b>MATERIAL SAFETY DATA SHEET</b>
Title: <b>LIQUID HELIUM MATERIAL SAFETY DATA SHEET</b>
Date of Issue: 1 August 2018
Date of Next Review: 1 August 2023

**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 freeze materials on contact causing these to become brittle.

When liquid helium 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.

<b>FIRE FIGHTING MEASURES:</b>
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**Flammability:**

Non Flammable.

**Fire/Explosion Hazard:**

Non-flammable, however exposure to fire may cause container to rupture/explode. Cylinders involved in a fire/explosion may rocket. Move cylinders from vicinity of fire if safe to do so.

Cool cylinders by spraying flooding quantities of water from a protected location. If unable to keep cylinders cool, evacuate area, minimum distance 200 meters.

**Extinguishing Media:**

Use appropriate media to extinguish source of surrounding fire. Cool cylinders with water if possible.

**Hazchem Code: 2 T**

**Recommended Protective Clothing:**

Breathing apparatus should be worn in confined space.

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Reason for Amendment:	UPDATE	Revision Number:	REV 003	Page Number:	4

<b>MATERIAL SAFETY DATA SHEET</b>
Title: <b>LIQUID HELIUM MATERIAL SAFETY DATA SHEET</b>
Date of Issue: 1 August 2018
Date of Next Review: 1 August 2023

Thermal protection from cryogenic temperatures required.

<b>ACCIDENTAL RELEASE MEASURES:</b>
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**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 helium, 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 freeze many materials on contact making these brittle.

<b>HANDLING AND STORAGE:</b>
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**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.

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<b>MATERIAL SAFETY DATA SHEET</b>
Title: <b>LIQUID HELIUM MATERIAL SAFETY DATA SHEET</b>
Date of Issue: 1 August 2018
Date of Next Review: 1 August 2023

**Approved Handlers:**

Approved handlers are not required, non-hazardous gas (HSNO) however extreme care should be taken when handling liquid helium.

**Approved Fillers:**

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

**Storage**

**Separation:**

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

**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.

<b>EXPOSURE CONTROLS / PERSONAL PROTECTION:</b>
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**Exposure Standards:**

Helium is a simple asphyxiant. Ensure adequate ventilation. Liquid Helium is extremely cold and additional care should be taken to avoid cryogenic 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 helium.

**Personal Protection:**

Personnel handling liquid helium 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 helium 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

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<b>MATERIAL SAFETY DATA SHEET</b>
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<b>PHYSICAL AND CHEMICAL PROPERTIES:</b>
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**Physical Properties**

Appearance: Colourless, Odourless, Tasteless Flashpoint: Non Flammable

**Boiling Point:** -269°C

**Flammability Limits:** Non Flammable

**Vapour Pressure:** Not Applicable

**Solubility in Water (at 0°C):** 1.5mg/l

**Other Properties**

Relative Density: (Air = 1): 0.14

Density of Liquid: 0.12

Molecular Weight: 4

Critical Temperature: -268 °C

<b>STABILITY AND REACTIVITY:</b>
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**Flammability:**

Helium is non- flammable.

**Materials Compatibility:** Not applicable. Liquid spillages can cause embrittlement.

**Stability:** Stable under normal conditions

<b>TOXICOLOGY INFORMATION:</b>
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No known toxicological effects from this product.

<b>ECOLOGICAL INFORMATION:</b>
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May cause frost bite to plants and vegetation.

<b>DISPOSAL CONSIDERATIONS:</b>
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Do not discharge into any place where its accumulation could be dangerous. To atmosphere in a well-ventilated place.

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Reason for Amendment:	UPDATE	Revision Number:	REV 003	Page Number:	7

<b>MATERIAL SAFETY DATA SHEET</b>
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<b>TRANSPORT INFORMATION:</b>
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**UN Number:** 1963  
**Proper Shipping Name:** HELIUM, REFRIDGERATED LIQUID  
**Dangerous Goods Class and Subsidiary Risk:** 2.2  
**Packing Group:** Not applicable  
**Hazchem Code:** 2 T

**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:**

Ensure that containers are firmly secured.  
 Ensure cylinder valve is closed and not leaking.  
 Ensure there is adequate ventilation.  
 Compliance with applicable regulations.

<b>REGULATORY INFORMATION:</b>
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**Environmental Protection Agency Register Approval No:** HSR001024

**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 Helium to other storage containers.

<b>OTHER INFORMATION:</b>
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Liquid Helium is supplied in double skinned insulated cryogenic Dewars.

**References:**

NZS 5433:2007 Transport of Dangerous Goods on Land  
 EPA Website – Approvals Register – [www.epa.govt.nz](http://www.epa.govt.nz)  
 SNZ HB76:2008 Dangerous Goods – Initial Emergency Response Guide  
 AS1678 2C1 Emergency Procedure Guide – Transport – Non-Flammable, Compressed Gas

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Reason for Amendment:	UPDATE	Revision Number:	REV 003	Page Number:	8



<b>MATERIAL SAFETY DATA SHEET</b>
<b>Title: LIQUID HELIUM MATERIAL SAFETY DATA SHEET</b>
Date of Issue: 1 August 2018
Date of Next Review: 1 August 2023

AS 4484-2004 - Gas Cylinders for Industrial, Scientific, medical and refrigerant use - Labelling and colour coding  
 AS 2473.2-2007 - Valves for compressed gas outlets - Part 2 Outlet connections (threaded) and stem (inlet) threads  
 AS 2473.3-2007 - Valves for compressed gas outlets - Part 3 Outlet connections for medical gases (including pin-indexed yoke connections)  
 Operators Handbook for the Transport of Dangerous Goods by Road – NZ Road Transport & Logistics Industry Training Organisation  
 NZCIC Code of Practice – Preparation of Safety Data Sheets

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Reason for Amendment:	UPDATE	Revision Number:	REV 003	Page Number:	9

<b>MATERIAL SAFETY DATA SHEET</b>
Title: <b>LIQUID HELIUM MATERIAL SAFETY DATA SHEET</b>
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<b>MSDS SUMMARY:</b>
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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 Southern Gas Services Limited.

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.

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Reason for Amendment:	UPDATE	Revision Number:	REV 003	Page Number:	10