

Liquid Helium

(Please ensure that this MSDS is received by the appropriate person)

Date: January 2018
Version 3 REF.:MS007

1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION

Product Name	LIQUID HELIUM
Chemical Formula	He
Visual Identification	The Portable Cryogenic Container (PCC) is made of polished stainless steel, and has the relevant decal affixed to the body of the PCC to clearly identify the contents.
Valve	The vapour outlet valve is Brass 5/8inch BSP right hand female.
Company Identification	African Oxygen Malawi Limited Johnstone Road, Ginnery Corner Blantyre Tel. No: +265(1) 871 611 Fax No: +265(1) 871 260

EMERGENCY NUMBER +265(1) 871 260 (24 hours)

2 COMPOSITION/ INFORMATION ON INGREDIENTS

Chemical Name	Helium
Chemical Family	Inert Rare Gas
CAS No.	7440-59-7
UN No.	1963
ERG No	120
Hazchem Warning	2 C Non-flammable gas

3 HAZARDS IDENTIFICATION

Main Hazards All Portable Cryogenic Containers (PCC's) containing cryogenic liquids must be regarded as pressure vessels at all times. Excessive exposure to heat could cause the internal pressure to increase significantly with the consequent violent rupturing of the vessel. Users of liquid helium must also take special precautions in addition to those necessary for the safe handling of such inert liquefied gases as nitrogen and argon. The extremely low temperature of liquid helium makes these special precautions imperative. (1) It can solidify all other gases. (2) It causes air to condense on any uninsulated or inadequately insulated pipe through which it passes. (3) This can result in a localised oxygen-enriched atmosphere by the condensation of oxygen-enriched liquid air.

Adverse health effects Liquid helium is non-life supporting.

Chemical Hazards Atmospheric air will condense on exposed helium-cooled piping. Nitrogen, having a lower boiling point than oxygen, will evaporate first from condensed air, leaving an oxygen-enriched liquid. This liquid may drip or flow to nearby surfaces. To prevent the possible ignition of grease, oil, or other combustible materials which could come into contact with the air-condensing surfaces, such areas must be cleaned to "oxygen-clean" standards. Any combustible foam-type organic polymer insulation should be carefully applied to reduce the possibility of this air condensation. The oxygen-enrichment process - which if followed by an impact could set off an explosive burning of the foam. Helium is extremely inert and forms no known chemical compounds.

Biological Hazards All precautions necessary for the safe handling of any gas liquefied at very low temperatures must be observed with liquid Helium. Extensive tissue damage similar to burns can result from exposure to liquid helium or cold helium vapours.

Vapour Inhalation As Helium acts as a simple asphyxiant, death may result from errors in judgement, confusion, or loss of consciousness which prevents self-rescue. At low oxygen concentrations, unconsciousness and death may occur in seconds without warning.

Eye Contact	Cold vapour can cause severe burn-like injuries.
Skin Contact	Frostbite can occur from contact cold vapour.
Ingestion	N/A
Carcinogenicity	Severe cold burns could result in carcinoma.

4 FIRST AID MEASURES

Prompt medical attention is mandatory in all cases of overexposure to helium. Rescue personnel should be equipped with self-contained breathing apparatus. In case of frostbite from contact with cold vapour, place the frost-bitten part in warm water, about 40 - 42°C. If warm water is not available, or is impractical to use, wrap the affected part gently in blankets. Encourage the patient to exercise the affected part whilst it is being warmed. Do not remove clothing whilst frosted. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be removed to an uncontaminated area, and given mouth-to-mouth resuscitation and supplemental oxygen.

Eye Contact Immediately flush with large quantities of tepid water, or with sterile saline solution. Seek medical attention.

Skin Contact See above for handling frostbite.

Ingestion Allow damaged areas to warm gently. Seek medical attention.

5 FIRE FIGHTING MEASURES

Extinguishing media As Helium is an inert gas, it does not contribute to the fire.

Specific Hazards Helium does not support life. It can act as a simple asphyxiant by diluting the concentration of oxygen in the air below the levels to support life.

Emergency Actions If possible, shut off the source of escaping Helium. Evacuate area. Keep the storage tank cool by spraying with water if exposed to a fire. CONTACT THE NEAREST AFROX BRANCH.

Protective Clothing Self contained breathing apparatus. Safety gloves and shoes, or boots, should be worn when handling containers. **Environment precautions.** Because Helium disperses so rapidly it would have no effect on the environment.

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions Do not enter any enclosed area where Helium has been spilled unless tests have shown that it is safe to do so.

Environmental precautions. Helium itself does not pose a hazard to the environment. However, because of the extreme cold of the vapour, damage to the ecology can occur in the immediate environs of the spill. **Small spills.** Shut off the source of escaping helium. Ventilate the area. **Large spills.** Evacuate the area. Shut off the source of the spill if this can be done without risk. Restrict access to the area until completion of the clean-up procedure.

7 HANDLING AND STORAGE

The potential hazards in handling liquid helium stem mainly from four important properties. (1) The liquid is extremely cold (Helium is the coldest of all cryogenic liquids). (2) The ultra-low temperature of the liquid Helium will condense and solidify air. (3) Very small amounts of liquid are converted into large volumes of gas. (4) Helium is non-life supporting. Liquid Helium is commonly stored at the consumer site in cryogenic liquid containers and specially designed insulated tanks. To minimise Helium transfer losses, the shipping container for liquid Helium is normally used for storage. Keep out of reach of children.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure hazards. As helium is a simple asphyxiant avoid any areas where spillage has taken place. Only enter once testing has proved the atmosphere to be safe.

Engineering control measures. Engineering control measures are preferred to reduce the exposure to oxygen depleted atmospheres. **Personal protection** Self-contained breathing apparatus should always be worn when entering area where oxygen depletion may have occurred. Safety goggles, gloves and shoes, or boots, should be worn when handling containers.

Skin. Wear loose-fitting overalls, preferably without pockets.



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9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DATA

Chemical Symbol	He
Molecular Weight	4,00
Boiling point @ 101,325 kPa	-268,94°C
Density, gas @ 101,325 kPa and 20°C	0,1664 kg/m ³
Relative Density of vapourised liquid (Air=1)	0,137
Critical temperature	-267,95°C
Latent heat of vapourisation @ boiling point	20,8 kJ/kg
Colour	None
Taste	None
Odour	None

10 STABILITY AND REACTIVITY

Conditions to avoid The dilution of the oxygen concentration in the atmosphere to levels which cannot support life.

Incompatible Materials. Liquid Helium must not be allowed to come into contact with air, and containers must be equipped with pressure relief devices that prevent back-leakage of air into liquid Helium equipment. Plugging by solidified air constitutes a serious safety hazard. At the temperature of liquid Helium, ordinary carbon steels and most alloy steels lose their ductility, and are considered unsafe for liquid Helium service. Satisfactory materials for use with liquid Helium include Type 18-8 stainless steel and other austenitic nickel-chromium alloys, copper, Monel, brass and aluminium.

Hazardous Decomposition Products. None

11 TOXICOLOGICAL INFORMATION

Acute Toxicity	No known effect.
Skin & eye contact	No known effect.
Chronic Toxicity	No known effect.

(For further information see Section 3. Adverse Health Effects).

12 ECOLOGICAL INFORMATION

Helium does not pose a hazard to the ecology.

13 DISPOSAL CONSIDERATIONS

Disposal Methods Small amounts may be blown to the atmosphere under controlled conditions. Large amounts should only be handled by the gas supplier.

Disposal of packaging The disposal of containers must only be handled by the gas supplier.

14 TRANSPORT INFORMATION

ROAD TRANSPORTATION

UN No.	1963
ERG No	120
Hazchem warning	2C Non-flammable gas

SEA TRANSPORTATION

IMDG	1963
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Class

Packaging group

Label Non-flammable gas

AIR TRANSPORTATION

ICAO/IATA Code	1963
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Class

2.2

Packaging group

Packaging instructions

- Cargo 202

- Passenger 202

Maximum quantity allowed

- Cargo 500 kg

- Passenger 50 kg

14 REGULATORY INFORMATION

EEC Hazard class: Non-flammable

National legislation: OHSact and Regulations 85 of 1993

Reference: SANS 10234 and its supplement.

16 OTHER INFORMATION

Bibliography

Compressed Gas Association, Arlington, Virginia

Handbook of Compressed Gases - 3rd Edition

Matheson. Matheson Gas Data Book - 6th Edition

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