MATERIAL SAFETY DATA SHEET

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MAJOR SUPPLIERS OF CRYOGENICS AND WELDING EQUIPMENT

MSDS # NV006502
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SECTION 1. MATERIAL IDENTIFICATION

Product Name
Liquid Helium

CAS # 7440-59-7

NFPA CODE 704/ HMIS

Health	3
Fire	0
Reactivity	0
Special Hazard	None

Trade Name And Synonym
Liquid Helium

DOT Identification No
UN-1963

Chemical Name And Synonyms
Liquid or Liquefied Helium

DOT Hazard Class
Division 2.2

Formula
Liquefied He

Chemical Family
Cryogenic Inert

Description
D.O.T. Shipping Name = Helium, Refrigerated Liquid; Extreme low temperature inert fluid.

SECTION 2. HEALTH HAZARD INFORMATION

Time Weighted Average Exposure Limit
Simple asphyxiant (ACGIH 1993-1994). OSHA 1991 - No listing. Oxygen levels should be maintained at greater than 18 Molar percent at normal atmospheric pressure which is equivalent to a partial pressure (pO2>135 torr).

NOTE: Except where specified, the health hazard data and most of the other data in this Material Safety Data Sheet are for GASEOUS helium. ONE VOLUME OF LIQUID HELIUM AT ITS BOILING POINT AND ATMOSPHERIC PRESSURE WILL VAPORIZE INTO APPROXIMATELY 755 VOLUMES OF GASEOUS HELIUM AT 70°F (21.1°C) AND 1 ATMOSPHERE.

Symptoms Of Exposure

Effects of exposure to high concentrations so as to displace the oxygen in the air necessary for life are headache, dizziness, labored breathing and eventual unconsciousness. Breathing mixtures of helium with adequate oxygen to support life modifies the voice sound so that it is higher "pitched."

Contact with the cryogenic liquid or cold piping containing the liquid can cause tissue freezing or frostbite on dermal contact or if splashed into the eyes.

WARNING: Hazards are associated with inhaling helium to alter the voice sound. DO NOT ALLOW THIS PRACTICE.

Toxicological Properties

Helium is nontoxic but the liberation of a large amount in a confined area could displace the amount of oxygen in air necessary to support life.

Helium is not listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen.

Persons in ill health, where such illness would be aggravated by exposure to these mixtures, should not be allowed to work with or handle this product.

Frostbite effects are a change in color of the skin to gray or white, possibly followed by blistering.

Recommended First Aid Treatment

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO HELIUM. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

INHALATION: 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 moved to an uncontaminated area, given assisted respiration and supplemental oxygen. Further treatment should be symptomatic and supportive.

For dermal contact or frostbite, flush affected areas with lukewarm water. DO NOT USE HOT WATER. A physician should see the patient promptly if the cryogenic "burn" has resulted in blistering of the dermal surface or deep tissue freezing.

SECTION 3. PHYSICAL DATA

Boiling Point
He = -452.1°F (-268.9°C)

Vapor Pressure @ 70° F (21.1°C)
(21.1°C)
He = above the critical temperature of -450.3°F (-268°C)

Solubility In Water
Negligible

Evaporation Rate
Typical cryogenic container rate

Appearance And Odor
Colorless, odorless gas. Liquid is clear.

Liquid Density at Boiling Point
He = 7.8 lb/ft3 (125 kg/m3)

Gas Density at 70°F 1 ATM
He = .0103 lb/ft3 (.1650 kg/m3)

Freezing Point
He Sublimation Point = -456.5°F (-271.3°C)

Specific Gravity (AIR = 1)
@ 70°F (21.1°C) = .138

SECTION 4. FIRE AND EXPLOSION HAZARD DATA

Flash Point
N/A

Auto Ignition Temperature
N/A

Flammable Units Percent by Volume
LEL N/A **UEL** N/A

Extinguishing Media
Nonflammable, inert

Electrical Classification
Nonhazardous

Special Firefighting Procedure
If containers are involved in a fire, safely relocate or keep cool with water spray.

Unusual Fire and Explosion Hazards
None

Hazardous Mixtures Of Other Liquids,Solids or Gases
None

SECTION 5. REACTIVITY DATA

Stability
☐ Unstable
☑ Stable

Conditions To Avoid
None

Hazardous Polymerization
☐ May Occur
☑ Will Not Occur

Conditions To Avoid
None

Incompatibility; (Materials to Avoid)
None

Hazardous Decomposition Products
None

SECTION 6. SPILL, LEAK AND DISPOSAL PROCEDURES

Steps to be taken in Case Material is Released or Spilled

Liquid helium is delivered to a customer into stationary vacuum-jacketed vessels at the customer's location or in portable vacuum-jacketed "liquid" containers.

Stationary customer-site vessels should be operated in accordance with the manufacturer's and your supplier's instructions. Do not attempt to repair, adjust or in any other way modify the operation of these vessels. If there is a malfunction or other type of operational problem with the vessel, contact the closest supplier location immediately.

Liquid helium cylinders should be used only in well-ventilated areas and in accordance with the manufacturer's and your

supplier's instructions. These cylinders must ALWAYS be kept in an upright position. Specialized hand trucks are needed for their movement. A "first in - first out" inventory system should be used with these cylinders.

Waste Disposal

See "Steps to be taken in case material is released or spilled"

SECTION 7. SPECIAL PROTECTION INFORMATION

Respiratory Protection

Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.

Ventilation	Local Exhaust	Special
Information not available	To prevent accumulation of high concentrations so as to reduce the oxygen level in the air to less than 18 Molar percent.	N/A
	Mechanical	**Other**
	N/A	N/A

Protective Gloves	Eye Protection
An	Safety goggles or glasses, plus face shield

Other Protective Equipment

Safety shoes

SECTION 8. SPECIAL PRECAUTIONS AND COMMENTS

Special Labeling Information

DOT Shipping Name:	Helium, Refrigerated Liquid (Cryogenic Liquid)	DOT Hazard Class:	Division 2.2
DOT Shipping Label:	Nonflammable Gas	I.D. No.:	UN 1963

Special Handling Recommendations

Liquid helium is delivered to a customer into stationary vacuum-jacketed vessels at the customer's location or in portable vacuum-jacketed "liquid" containers.

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Liquid helium cylinders should be used only in well-ventilated areas and in accordance with the manufacturer's and your supplier's instructions. These cylinders must ALWAYS be kept in an upright position. Specialized hand trucks are needed for their movement. A "first in - first out" inventory system should be used with these cylinders.

For additional handling recommendations, consult Compressed Gas Association Pamphlets P-9, P-12, and P-14, and Safety Bulletin SB-2.

Special Storage Recommendations

Liquid helium is delivered to a customer into stationary vacuum-jacketed vessels at the customer's location or in portable vacuum-jacketed "liquid" containers.

Stationary customer-site vessels should be operated in accordance with the manufacturer's and your supplier's instructions. Do not attempt to repair, adjust or in any other way modify the operation of these vessels. If there is a malfunction or other type of operational problem with the vessel, contact the closest supplier location immediately.

Liquid helium cylinders should be used only in well-ventilated areas and in accordance with the manufacturer's and your supplier's instructions. These cylinders must ALWAYS be kept in an upright position. Specialized hand trucks are needed for their movement. A "first in - first out" inventory system should be used with these cylinders.

For additional storage recommendations, consult Compressed Gas Association Pamphlets P-9, P-12, and P-14, and

Safety Bulletin SB-2.

Special Packaging Recommendations

Liquid helium cannot be handled in carbon or low alloy steels. Eighteen-eight and 18-10 stainless steels are acceptable as are copper and its alloys, nickel and its alloys, brass, bronze, silicon alloys, Monel® and Iconel®.

Also see Compressed Gas Association Pamphlets P-9, P-12, and P-14, and Safety Bulletin SB-2.

Other Recommendations or Precautions

Liquefied gas cylinders should not be refilled except by qualified producers of these products. Shipment of a compressed gas container which has not been filled by the owner or with his (written) consent is a violation of Federal Law (49CFR).

Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pickup type vehicles.

Special Notes

Reporting under SARA, Title III, Section 313 not required.