Linde Gas (216) 642-6600
P.O. Box 94737
Cleveland, OH 44101-4737
www.us.lindegas.com

MATERIAL SAFETY DATA SHEET
No. 31

SECTION 1. PRODUCT INFORMATION

NAME : Helium

TRADE NAME AND SYNONYMS: Helium, Compressed (D.O.T.)

APPEARANCE AND ODOR : Colorless, odorless gas

CHEMICAL NAME AND SYNONYMS : Helium gas

CAS # : 7440-59-7

DOT I.D. No : UN 1046

DOT HAZARD CLASS : Division 2.2

CHEMICAL FORMULA : He

CHEMICAL FAMILY : Rare Gas

ISSUE DATE AND REVISIONS : Revised October 2005

SECTION 2. HEALTH HAZARD DATA

EMERGENCY OVERVIEW : Helium is a non-flammable, inert gas which is lighter than air.

Inhalation: Moderate concentrations so as to exclude an adequate supply of oxygen to the lungs causes dizziness, drowsiness and eventual unconsciousness.

Symptoms of exposure to high concentrations so as to displace the oxygen in air necessary for life may include any, all or none of the following:

~ Loss of balance or dizziness
~ Tightness in the frontal area of the forehead
~ Tingling in the tongue, fingertips or toes
~ Weakened speech leading to the inability to utter sounds
~ Rapid reduction in the ability to perform movements
~ Reduced consciousness of the surroundings
~ Loss of tactile sensations
~ Heightened mental activity

It should be recognized that it is possible that none of the above symptoms may occur in Helium asphyxia so that there are no definite warning symptoms.

Breathing mixtures of Helium with adequate oxygen to support life modifies the voice sound so that it is higher "pitched".

TIME WEIGHTED AVERAGE EXPOSURE LIMIT : Helium is defined as a simple asphyxiant (ACGIH 2004). OSHA 2004 has no listing for Helium.

Oxygen levels should be maintained at greater than 19.5 Molar percent at normal atmospheric pressure (pO_2>148 torr).

SECTION 2. HEALTH HAZARD DATA, CONT'D

TOXICOLOGICAL PROPERTIES : Helium is nontoxic but the liberation of a large amount in a confined area could displace the amount or oxygen in the 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 Helium should not be allowed to work with or handle this product.

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

SECTION 3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED) : N/A

AUTO IGNITION TEMPERATURE : N/A

FLAMMABLE LIMITS (% BY VOLUME) LEL = N/A UEL = NA

EXTINGUISHING MEDIA : Nonflammable, inert gas

SPECIAL FIRE FIGHTING PROCEDURES : None

UNUSUAL FIRE AND EXPLOSION HAZARDS : If cylinders are involved in a fire, safely relocate or keep cool with water spray.

SECTION 4. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED : Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, contact the closest supplier location or call the emergency telephone number listed herein.

WASTE DISPOSAL METHOD : Do not attempt to dispose of waste or unused quantities. Return in the shipping container *properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place* to your supplier. For emergency disposal assistance, contact your closest supplier location or call the emergency telephone number listed herein.

SECTION 5. HAZARDOUS MIXTURE PRECAUTIONS

None

SECTION 6. REACTIVITY DATA

STABILITY : Stable
CONDITIONS TO AVOID : None

INCOMPATIBILITY (MATERIALS TO AVOID) : None

HAZARDOUS DECOMPOSITION PRODUCTS : None

HAZARDOUS POLYMERIZATION POTENTIAL : Will not occur
CONDITIONS TO AVOID : None

SECTION 7. SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION : DOT Shipping Name: Helium. Compressed
DOT Shipping Label Nonflammable Gas
DOTHazard Class: Division 2.2
I.D. No.: UN 1046

SPECIAL HANDLING RECOMMENDATIONS : Use only in well-ventilated areas. Valve protection caps must remain In place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinders to lower pressure (<3,000 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

For additional handling recommendations, consult Compressed Gas Association's Pamphlets P-1, P- 14 and Safety Bulletin SB-2.

SPECIAL STORAGE RECOMMENDATIIONS : Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125°F (52°C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time.

For additional storage recommendations, consult Compressed Gas Association's Pamphlets P-1, P-14 and Safety Bulletin SB-2.

SPECIAL PACKAGING RECOMMENDATIONS : Helium is non-corrosive and may be used with any common structural material.

*Various Government agencies (i.e. Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.

SECTION 8. SPECIAL PROTECTION INFORMATION

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

SECTION 8. SPECIAL PROTECTION INFORMATION, CONT'D

VENTILATION : See Local Exhaust

LOCAL EXHAUST : To prevent the accumulation of high concentrations so as to reduce the oxygen level to less than 19.5 molar percent.

SPECIAL : N/A

MECHANICAL : N/A

OTHER : N/A

PROTECTIVE GLOVES : Any material

EYE PROTECTION : Safety goggles or glasses

OTHER PROTECTIVE EQUIPMENT : Safety shoes

SECTION 9. PHYSICAL DATA

BOILING POINT: -452.1°F (-268.9°C)

LIQUID DENSITY AT BOILING POINT: 7.8 lb/ft3 (125 kg/m3)

VAPOR PRESSURE: @ 70°F (21.1°C) above the critical temperature of -450.3°F (-268°C)

GAS DENSITY AT 70° F, 1atm: .0103 lb/ft3 (0.165 kg/m3)

SOLUBILITY IN WATER: Negligible

FREEZING POINT: Υ point = -456.5°F (-271.3°C)

EVAPORATION RATE: N/A (Gas)

SPECIFIC GRAVITY (Air =1): @ 70°F (21.1°C) = 0.138

SECTION 10. ADDITIONAL RECOMMENDATIONS OR PRECAUTIONS:

Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder 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 pick-up type vehicles.

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

NFPA 704 No. for Helium = 1 (Health) 0 (Flammability) 0 (Instability) None (Special)

Information contained in this material safety data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information is not intended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering any process, composition or manner of use.

Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or damage incurred from the improper use of such product.