



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

MATERIAL SAFETY DATA SHEET

No. 161

PRODUCT NAME 2% Hydrogen in Helium	CAS # H ₂ = 1333-74-0 He = 7440-59-7
TRADE NAME AND SYNONYMS Compressed gas, n.o.s.	DOT I.D. No.: UN 1956
CHEMICAL NAME AND SYNONYMS 2 Molar % Hydrogen in Helium	DOT Hazard Class: Division 2.2
ISSUE DATES AND REVISIONS Revised January 1995	Formula 2 Molar % H ₂ in He
	Chemical Family: Gas Mixture

HEALTH HAZARD DATA

<p>TIME WEIGHTED AVERAGE EXPOSURE LIMIT Hydrogen and helium are simple asphyxiants (ACGIH 1994-1995). OSHA 1993 does not list a PEL (8 Hr. TWA) for hydrogen or helium. (Continued on Page 4)</p>
<p>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."</p>
<p>TOXICOLOGICAL PROPERTIES This mixture is nontoxic but the liberation of a large amount in a confined area could displace the amount of oxygen in the air necessary to support life. This mixture 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 this mixture should not be allowed to work with or handle this product.</p>
<p>RECOMMENDED FIRST AID TREATMENT PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO THIS MIXTURE. 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.</p>

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 to be 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 of matter or 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 proper or improper use of such product.

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	
None	
PHYSICAL DATA	
BOILING POINT H ₂ - -423°F (-252.8 C) He = -452.1°F (-268.9°C)	LIQUID DENSITY AT BOILING POINT See Page 4
VAPOR PRESSURE @ 70°F (21.1°C) = above the critical temperature	GAS DENSITY AT 70°F, 1 atm .01024 lb/ft ³ (.16399 kg/m ³)
SOLUBILITY IN WATER Negligible	FREEZING POINT H ₂ = -434.6°F (-259.2°C) He λ Pt = -456.5°F (-271.3°C)
EVAPORATION RATE N/A (Gas)	SPECIFIC GRAVITY (AIR=1) @ 70°F (21.1°C) = 0.137
APPEARANCE AND ODOR Colorless, odorless gas	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) N/A	AUTO IGNITION TEMPERATURE N/A	FLAMMABLE LIMITS % BY VOLUME (See Page 4) LE N/A UEL N/A
EXTINGUISHING MEDIA Nonflammable, inert gas		ELECTRICAL CLASSIFICATION Nonhazardous
SPECIAL FIRE FIGHTING PROCEDURES If cylinders are involved in a fire, safely relocate or keep cool with water spray.		
UNUSUAL FIRE AND EXPLOSION HAZARDS None		

REACTIVITY DATA

STABILITY Unstable		CONDITIONS TO AVOID None
Stable	X	
INCOMPATIBILITY (Materials to avoid) None		
HAZARDOUS DECOMPOSITION PRODUCTS None		
HAZARDOUS POLYMERIZATION May Occur		CONDITIONS TO AVOID
Will Not Occur	X	None

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Evacuate all personnel from a affected area. Use appropriate protective equipment. If leak is in container or container valve, contact your 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 <u>properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place</u> to your supplier. For emergency disposal assistance, contact your (Continued on Page 4)

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.		
VENTILATION See local exhaust	LOCAL EXHAUST See page 4	SPECIAL N/A
	MECHANICAL (Gen.) N/A	OTHER N/A
PROTECTIVE GLOVES Any material		
EYE PROTECTION Safety goggles or glasses		
OTHER PROTECTIVE EQUIPMENT Safety Shoes		

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION DOT Shipping Name: Compressed gas, n.o.s. DOT Shipping Label: Nonflammable Gas	DOT Hazard Class: Division 2.2 I.D. No.: UN 1956
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 cylinder 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-9, P-14 and Safety Bulletin SB-2.	
SPECIAL STORAGE RECOMMENDATIONS 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 125F (52C). 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-9, P-14 and Safety Bulletin SB-2.	
SPECIAL PACKAGING RECOMMENDATIONS This mixture is noncorrosive and may be used with any common structural material.	
OTHER 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).	

(Continued on Page 4)

*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.

