HELIUM, GAS
Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Product Name</th>
<th>HELIUM, GAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Code(s)</td>
<td>G-5, 1013</td>
</tr>
<tr>
<td>UN-No</td>
<td>UN1046</td>
</tr>
<tr>
<td>Recommended Use</td>
<td>Compressed gas.</td>
</tr>
<tr>
<td>Synonyms</td>
<td>LASER Helium; LASER Helium Ultra; Helium; Helium, compressed; Helium-4</td>
</tr>
</tbody>
</table>

Supplier Address*

- Linde Gas North America LLC - Linde Merchant Production Inc. - Linde LLC
  575 Mountain Ave.
  Murray Hill, NJ 07974
  Phone: 908-464-8100
  www.lindeus.com

- Linde Gas Puerto Rico, Inc.
  Las Palmas Village
  Road No. 869, Street No. 7
  Catano, Puerto Rico 00962
  Phone: 787-641-7445
  www.pr.lindegas.com

- Linde Canada Limited
  5860 Chedworth Way
  Mississauga, Ontario L5R 0A2
  Phone: 905-501-1700
  www.lindecanada.com

* May include subsidiaries or affiliate companies/divisions.

For additional product information contact your local customer service.

Chemical Emergency Phone Number

Chemtrec: 1-800-424-9300 for US/ 703-527-3887 outside US

2. HAZARDS IDENTIFICATION

**WARNING!**

Emergency Overview

Simple asphyxiant
Contents under pressure
Intentional misuse of this product can cause serious lung damage or death.
Keep at temperatures below 52°C / 125°F

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Colorless</th>
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</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Compressed gas.</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
</tbody>
</table>

OSHA Regulatory Status

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Potential Health Effects
Principle Routes of Exposure

Inhalation.

Acute Toxicity

Inhalation

Simple asphyxiant. May cause suffocation by displacing the oxygen in the air. Exposure to oxygen-deficient atmosphere (<19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8-10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.

Intentional inhalation of helium balloon gas can cause asphyxiation, lung damage, and death.

Eyes

None known.

Skin

None known.

Skin Absorption Hazard

No known hazard in contact with skin.

Ingestion

None known.

Chronic Effects

None known.

Aggravated Medical Conditions

None known.

Environmental Hazard

See Section 12 for additional Ecological Information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>Volume %</th>
<th>Chemical Formula</th>
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<tbody>
<tr>
<td>Helium</td>
<td>7440-59-7</td>
<td>&gt;99</td>
<td>He</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Eye Contact

None under normal use. Get medical attention if symptoms occur.

Skin Contact

None under normal use. Get medical attention if symptoms occur.

Inhalation

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF INHALATION OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Conscious inhalation victims should be assisted to an uncontaminated area and inhale fresh air. If breathing is difficult, administer oxygen. Unconscious persons should be moved to an uncontaminated area and, as necessary, given artificial resuscitation and supplemental oxygen. Treatment should be symptomatic and supportive.

Ingestion

None under normal use. Get medical attention if symptoms occur.

Notes to Physician

Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Flammable Properties

Not flammable.
Suitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Explosion Data

Sensitivity to Mechanical Impact
None

Sensitivity to Static Discharge
None

Specific Hazards Arising from the Chemical
Cylinders may rupture under extreme heat. Continue to cool fire exposed cylinders until flames are extinguished. Damaged cylinders should be handled only by specialists.

Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOHS (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Ensure adequate ventilation. Evacuate personnel to safe areas. Use personal protective equipment. Monitor oxygen level.

Environmental Precautions
Prevent spreading of vapors through sewers, ventilation systems and confined areas.

Methods for Containment
Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. If leak is in container or container valve, contact the appropriate emergency telephone number in Section 1 or call your closest Linde location.

Methods for Cleaning Up
Return cylinder to Linde or an authorized distributor.

7. HANDLING AND STORAGE

Handling
Use only in ventilated areas. Never attempt to lift a cylinder by its valve protection cap. Protect cylinders from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distance, use a cart designed to transport cylinders. Use equipment rated for cylinder pressure. Use backflow preventive device in piping. Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing leak to occur.

Proper handling, storage of regulating equipment and cylinders is required to safely fill helium balloons. DO NOT ALLOW CHILDREN OR UNQUALIFIED PEOPLE TO OPERATE BALOON FILLING EQUIPMENT. INTENTIONAL INHALATION OF HELIUM CAN CAUSE SERIOUS LUNG DAMAGE OR DEATH. A balloon filling helium regulator must be attached to the valve before it is opened.

Use an adjustable strap wrench to remove over-tight or rusted caps. Close valve after each use and when empty. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier.

Never put cylinders into trunks of cars or unventilated areas of passenger vehicles. Never attempt to refill a compressed gas cylinder without the owner’s written consent. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit.

For additional recommendations, consult Compressed Gas Association’s pamphlets P-1, P-9, P-9.1, P-18, SB-14 and Safety Bulletin SB-2.
Storage

Protect from physical damage. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling. Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Keep at temperatures below 52°C / 125°F. Full and empty cylinders should be segregated. Use a “first in-first out” inventory system to prevent full cylinders from being stored for excessive periods of time. Always store and handle compressed gas cylinders in accordance with Compressed Gas Association, pamphlet CGA-P1, Safe Handling of Compressed Gases in Containers.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

This product does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering Measures

Local exhaust ventilation to prevent accumulation of high concentrations and maintain air-oxygen levels at or above 19.5%.

Ventilation

Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/Face Protection

Wear protective eyewear (safety glasses).

Skin and Body Protection

Work gloves and safety shoes are recommended when handling cylinders.

Respiratory Protection

General Use

No special protective equipment required.

Emergency Use

Use positive pressure airline respirator with escape cylinder or self contained breathing apparatus for oxygen-deficient atmospheres (<19.5%).

Hygiene Measures

Wear suitable gloves and eye/face protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Colorless.

Odor Threshold

No information available.

Flash Point

No information available.

Decomposition Temperature

No information available.

Freezing Point

No information available.

Water Solubility

0.0094 vol/vol @ 0°C

Vapor Pressure

No data available.

Gas Density

(at 21.1°C/70°F) 0.0103 lb/ft³ (0.165 kg/m³)

Specific Vol. @ 21.1°C & 1 atm

97.09 ft³/lb (6.061 m³/kg)

Critical Pressure

33.0 psia (227 kPa abs)

Odor

Odorless.

Physical State

Compressed gas

Autoignition Temperature

No information available.

Boiling Point/Range

-268.9°C / -452.1°F

Molecular Weight

4.00

Evaporation Rate

No information available

Vapor Density

0.14 (air = 1)

VOC Content (%)

Not applicable.

10. STABILITY AND REACTIVITY

Stability

Stable.

Incompatible Products

None known.
Conditions to Avoid

None known.

Hazardous Decomposition Products

None known based on information supplied.

Hazardous Polymerization

Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

LD50 Oral: No information available.
LD50 Dermal: No information available.
LC50 Inhalation: No information available.
Repeated Dose Toxicity No information available.

Chronic Toxicity

Chronic Toxicity None known.
Carcinogenicity Contains no ingredient listed as a carcinogen.

Irritation No information available.
Sensitization No information available.
Reproductive Toxicity No information available.
Developmental Toxicity Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.
Synergistic Materials None known.
Target Organ Effects None known.

12. ECOLOGICAL INFORMATION

Ecotoxicity

The environmental impact of this product has not been fully investigated.

Ozone depletion potential; ODP; (R-11 = 1): Does not contain ozone depleting chemical (40 CFR Part 82).

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods Do not attempt to dispose of residual 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 Linde for proper disposal.
### 14. TRANSPORT INFORMATION

#### DOT

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#### IATA

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<tr>
<td>Maximum Quantity for Passenger</td>
<td>75 kg</td>
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<tr>
<td>Maximum Quantity for Cargo Only</td>
<td>150 kg</td>
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#### IMDG/IMO

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#### ADR

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15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Inventory Type</th>
<th>Compliance</th>
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<tbody>
<tr>
<td>TSCA</td>
<td>Complies</td>
</tr>
<tr>
<td>DSL</td>
<td>Complies</td>
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<tr>
<td>EINECS/ELINCS</td>
<td>Complies</td>
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Legend

- TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
- DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
- EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

U.S. Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

- Acute Health Hazard: No
- Chronic Health Hazard: No
- Fire Hazard: No
- Sudden Release of Pressure Hazard: Yes
- Reactive Hazard: No

Clean Water Act
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

Risk and Process Safety Management Programs
This material, as supplied, does not contain any regulated substances with specified thresholds under 40 CFR Part 68.
This product does not contain any substances regulated as Highly Hazardous Chemicals pursuant to the 29 CFR Part 1910.110.

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)
This product does not contain any substances regulated as hazardous air pollutants (HAPS) under Section 112 of the Clean Air Act Amendments of 1990.

CERCLA/SARA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

U.S. State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations
International Regulations

Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class
A  Compressed gases

16. OTHER INFORMATION

Prepared By
Product Stewardship
23 British American Blvd.
Latham, NY 12110
1-800-572-6501

Issuing Date
04-Mar-2010

Revision Date
25-Aug-2010

Revision Number
1

Revision Note
(M)SDS sections updated. 1.

NFPA
Health Hazard 0  Flammability 0  Stability 0  Physical and Chemical Hazards Simple asphyxiant

HMIS
Health Hazard 0  Flammability 0  Physical Hazard 3  Personal Protection -

Note: Ratings were assigned in accordance with Compressed Gas Association (CGA) guidelines as published in CGA Pamphlet P-19-2009, CGA Recommended Hazard Ratings for Compressed Gases, 3rd Edition.

General Disclaimer
For terms and conditions, including limitation of liability, please refer to the purchase agreement in effect between Linde LLC, Linde Merchant Production, Inc. or Linde Gas North America LLC (or any of their affiliates and subsidiaries) and the purchaser.

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End of Safety Data Sheet