

# Helium - He

## Chemical properties of helium - Health effects of helium

<b>Atomic number</b>	2
<b>Atomic mass</b>	4.00260 g.mol <sup>-1</sup>
<b>Density</b>	0.178*10 <sup>-3</sup> g.cm <sup>-3</sup> at 20 °C
<b>Melting point</b>	- 272.2 (26 atm)°C
<b>Boiling point</b>	- 268.9 °C
<b>Isotopes</b>	2

### *Helium*

#### *Properties*

Gaseous chemical element, symbol: He, atomic number: 2 and atomic weight 4,0026 g/mol. Helium is one of the noble gases of group O in the periodic table. It's the second lightest element. The main helium source in the world is a series of fields of natural gas in the United States.

Helium is a colorless, odorless, insipid and non-toxic gas. It's less soluble in water than any other gas. It's the less reactive element and doesn't essentially form chemical compounds. The density and viscosity of helium vapor are very low. Helium can be liquefied, but its condensation temperature is the lowest among all the known substances.

#### *Applications*

Helium has many unique properties: low boiling point, low density, low solubility, high thermal conductivity and inertness, so it is used for any application which can exploit these properties. Helium was the first gas used for filling balloons and dirigibles. This application goes on in altitude research and for meteorological balloons. The main use of helium is as an inert protection gas in autogenous welding. Helium is the only coolant which is capable of reaching temperatures lower than 15 K (-434°F). The main application of ultralow temperature is in the development of the superconductivity state, in which the resistance to the electricity flux is almost zero. Other applications are its use as pressurizing gas in liquid propellants for rockets, in helium-oxygen mixtures for divers, as working fluid in nuclear reactors cooled down by gas and as gas carrier in chemical analysis by gas chromatography.

#### *Helium in the environment*

Helium is the second most abundant element in the known universe, after hydrogen. Helium constitutes the 23% of all elemental matter measured by mass. Helium is formed in The Earth by natural radioactive decay of heavier elements. Most of this helium migrates to the surface and enters the atmosphere. Its low molecular weight allows it to escape to space at the same rate of its formation. Helium is the 71st most abundant element in the Earth's crust where it is found in 8 parts per billion (10<sup>9</sup>).

#### *Health effects*

*Effects of exposure:* The substance can be absorbed into the body by inhalation. Inhalation: High voice. Dizziness. Dullness. Headache. Suffocation. Skin: on contact with liquid: frostbite. Eyes: on contact with liquid: frostbite. Inhalation risk: On loss of containment this gas can cause suffocation by lowering the oxygen content of the air in confined areas. Check oxygen content before entering area. Neutral helium at standard conditions is non-toxic, plays no biological role and is found in trace amounts in human blood.

# Safety Data Sheet

acc. to OSHA HCS (29 CFR 1910.1200)

Printing date 11/16/2015

Reviewed on 11/16/2015

## 1 Identification

- **Product identifier**
- **Trade name: Helium Cylinder**
- **Article number:** 89998, 89999
- **Recommended use and restriction on use**
- **Recommended use:** Party favor.
- **Restrictions on use:** Contact manufacturer
- **Details of the supplier of the Safety Data Sheet**
- **Manufacturer/Supplier:**  
Unique Industries, Inc.  
4750 League Island Boulevard  
Philadelphia, PA 19122 USA  
Tel (215)336-4300
- **Emergency telephone number:**  
ChemTel Inc.  
+1 (800)255-3924, +1 (813)248-0585



## 2 Hazard(s) identification

- **Classification of the substance or mixture**



GHS04 Gas cylinder

Press. Gas            H280 Contains gas under pressure; may explode if heated.

Simple Asphyxiant            May displace oxygen and cause rapid suffocation.

- **Additional information:**

There are no other hazards not otherwise classified that have been identified.

0 % of the mixture consists of component(s) of unknown toxicity.

- **Label elements**

- **GHS label elements**

The product is classified and labeled according to the Globally Harmonized System (GHS).

- **Hazard pictograms:**



GHS04

- **Signal word:** Warning

- **Hazard statements:**

H280 Contains gas under pressure; may explode if heated.

May displace oxygen and cause rapid suffocation.

- **Precautionary statements:**

P410+P403 Protect from sunlight. Store in a well-ventilated place.

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### 3 Composition/information on ingredients

- **Chemical characterization: Mixtures**
- **Description:** Mixture of the substances listed below with nonhazardous additions.

- **Dangerous components:**

7440-59-7	helium	⚠ Press. Gas, H280	>80%
132259-10-0	compressed air	⚠ Press. Gas, H280	10-20%

- **Additional information:**

For the listed ingredient(s), the identity and exact percentage(s) are being withheld as a trade secret.

### 4 First-aid measures

- **Description of first aid measures**
- **General information:** No special measures required.
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:**  
In cases of frostbite, rinse with plenty of water. Do not remove clothing.  
If skin irritation is experienced, consult a doctor.
- **After eye contact:**  
Remove contact lenses if worn.  
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- **After swallowing:** Unlikely route of exposure.
- **Information for doctor**
- **Most important symptoms and effects, both acute and delayed:**  
Dizziness  
Frostbite
- **Danger:** May displace oxygen and cause rapid suffocation.
- **Indication of any immediate medical attention and special treatment needed:**  
If necessary oxygen respiration treatment.

### 5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
- **For safety reasons unsuitable extinguishing agents:** None.
- **Special hazards arising from the substance or mixture** Risk of explosion if heated under confinement.
- **Advice for firefighters**
- **Protective equipment:**  
Wear self-contained respiratory protective device.  
Wear fully protective suit.
- **Additional information:** Cool endangered product with water spray.

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## 6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures:**  
Ensure adequate ventilation.
- **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:** Allow to evaporate.
- **Reference to other sections:**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

## 7 Handling and storage

- **Handling**
- **Precautions for safe handling:** Use only in well ventilated areas.
- **Information about protection against explosions and fires:**  
Risk of explosion if heated under confinement.
- **Conditions for safe storage, including any incompatibilities**
- **Storage**
- **Requirements to be met by storerooms and receptacles:** Store in a cool location.
- **Information about storage in one common storage facility:** Store away from foodstuffs.
- **Further information about storage conditions:** Keep containers tightly sealed.
- **Specific end use(s):** No relevant information available.

## 8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see item 7.
- **Control parameters**

### Components with limit values that require monitoring at the workplace:

#### 7440-59-7 helium

TLV (USA)	TLV withdrawn, see App. F; simple asphyxiant
EL (Canada)	Simple asphyxiant
LMPE (Mexico)	Asfixiante simple

- **Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**  
The usual precautionary measures for handling chemicals should be followed.  
Keep away from foodstuffs, beverages and feed.  
Wash hands before breaks and at the end of work.
- **Engineering controls:** Store in a well-ventilated place.
- **Breathing equipment:**  
Not required under normal conditions of use.  
Use suitable respiratory protective device in case of insufficient ventilation.
- **Protection of hands:** Not required under normal conditions of use.

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- **Eye protection:** Follow relevant national guidelines concerning the use of protective eyewear.
- **Body protection:**  
Not required under normal conditions of use.  
None
- **Limitation and supervision of exposure into the environment** No relevant information available.

## 9 Physical and chemical properties

### · Information on basic physical and chemical properties

#### · General information

#### · Appearance:

Form: Compressed gas

Color: Clear

· Odor: Recognizable

· Odor threshold: Not determined.

· pH-value: Not determined.

#### · Change in condition:

Melting point/Melting range: Not determined.

Boiling point/Boiling range: <-200 °C (<-328 °F)

· Flash point: Not applicable.

· Flammability (solid, gaseous): Not determined.

· Auto-ignition temperature: Not determined.

· Decomposition temperature: Not determined.

· Auto igniting: Product is not self-igniting.

· Danger of explosion: Not determined.

#### · Explosion limits:

Lower: Not determined.

Upper: Not determined.

· Oxidizing properties: Not determined.

· Vapor pressure: Not determined.

· Density: Not determined.

· Relative density: Not determined.

· Vapor density: Not determined.

· Evaporation rate: Not applicable.

#### · Solubility in / Miscibility with:

Water: Slightly soluble.

· Partition coefficient (n-octanol/water): Not determined.

#### · Viscosity:

Dynamic: Not determined.

Kinematic: Not determined.

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· **Other information** No relevant information available.

## 10 Stability and reactivity

- **Reactivity:** No relevant information available.
- **Chemical stability:** Stable under normal temperatures and pressures.
- **Thermal decomposition / conditions to be avoided:**  
Contains gas under pressure; may explode if heated.
- **Possibility of hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** No relevant information available.
- **Incompatible materials:** No relevant information available.
- **Hazardous decomposition products:** Possible in traces.

## 11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**
- **LD/LC50 values that are relevant for classification:** None.
- **Primary irritant effect:**
- **On the skin:** Based on available data, the classification criteria are not met.
- **On the eye:** Based on available data, the classification criteria are not met.
- **Sensitization:** No sensitizing effects known.
- **Additional toxicological information:**
- **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

None of the ingredients are listed.

· **NTP (National Toxicology Program):**

None of the ingredients are listed.

· **OSHA-Ca (Occupational Safety & Health Administration):**

None of the ingredients are listed.

· **Probable route(s) of exposure:**

Inhalation.  
Eye contact.  
Skin contact.

· **Acute effects (acute toxicity, irritation and corrosivity):**

May displace oxygen and cause rapid suffocation.

· **Repeated dose toxicity:** No relevant information available.

· **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**

· **Germ cell mutagenicity:** Based on available data, the classification criteria are not met.

· **Carcinogenicity:** Based on available data, the classification criteria are not met.

· **Reproductive toxicity:** Based on available data, the classification criteria are not met.

· **STOT-single exposure:** Based on available data, the classification criteria are not met.

· **STOT-repeated exposure:** Based on available data, the classification criteria are not met.

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· **Aspiration hazard:** Based on available data, the classification criteria are not met.

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## 12 Ecological information

- **Toxicity**
- **Aquatic toxicity:** No relevant information available.
- **Persistence and degradability:** No relevant information available.
- **Behavior in environmental systems**
- **Bioaccumulative potential:** No relevant information available.
- **Mobility in soil:** No relevant information available.
- **Additional ecological information**
- **General notes:** Generally not hazardous for water
- **Other adverse effects:** No relevant information available.

## 13 Disposal considerations

- **Waste treatment methods**
- **Recommendation:**  
Must not be disposed of together with household garbage. Do not allow product to reach sewage system. The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and nonhazardous wastes.
- **Uncleaned packagings**
- **Recommendation:** Disposal must be made according to official regulations.
- **Recommended cleansing agent:** Water, if necessary with cleansing agents.

## 14 Transport information

- |                                     |  |
|-------------------------------------|--|
| · <b>UN-Number</b>                  |  |
| · <b>DOT, ADR, IMDG, IATA</b>       | UN1956   |
| · <b>UN proper shipping name</b>    |  |
| · <b>DOT, IMDG, IATA</b>            | COMPRESSED GAS, N.O.S. (HELIUM, COMPRESSED AIR)      |
| · <b>ADR</b>                        | 1956 COMPRESSED GAS, N.O.S. (HELIUM, COMPRESSED AIR) |
| · <b>Transport hazard class(es)</b> |  |
| · <b>DOT</b>                        |  |
| · <b>Class</b>                      | 2 Gases  |



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· Label	2.2
· ADR	
	
· Class	2 1A Gases
· Label	2.2
· IMDG, IATA	
	
· Class	2 Gases
· Label	2.2
· Packing group	This UN-number is not assigned a packing group.
· Environmental hazards	Not applicable.
· Special precautions for user	Warning: Gases
· Danger code (Kemler):	20
· EMS Number:	F-C,S-V
· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
· Transport/Additional information:	
· ADR	
· Excepted quantities (EQ)	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· UN "Model Regulation"	UN 1956 COMPRESSED GAS, N.O.S. (HELIUM, COMPRESSED, COMPRESSED AIR), 2.2

## 15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
- United States (USA)
- SARA

### · Section 302 (extremely hazardous substances):

None of the ingredients are listed.

### · Section 304 (emergency release notification):

None of the ingredients are listed.

### · Sections 311/312 (hazardous chemical threshold planning quantity in pounds):

None of the ingredients are listed.

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· **Section 355 (extremely hazardous substances):**

None of the ingredients are listed.

· **Section 313 (Specific toxic chemical listings):**

None of the ingredients are listed.

· **TSCA (Toxic Substances Control Act)**

7440-59-7 | helium

· **Proposition 65 (California)**

· **Chemicals known to cause cancer:**

None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients are listed.

· **Chemicals known to cause developmental toxicity:**

None of the ingredients are listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency):**

None of the ingredients are listed.

· **IARC (International Agency for Research on Cancer):**

None of the ingredients are listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health):**

None of the ingredients are listed.

· **Canadian substance listings**

· **Canadian Domestic Substances List (DSL):**

7440-59-7 | helium

· **Canadian Ingredient Disclosure list (limit 0.1%):**

None of the ingredients are listed.

· **Canadian Ingredient Disclosure list (limit 1%):**

None of the ingredients are listed.

## 16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Date of preparation / last revision** 11/16/2015 / -

· **Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

EINECS: European Inventory of Existing Commercial Chemical Substances

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ELINCS: European List of Notified Chemical Substances  
CAS: Chemical Abstracts Service (division of the American Chemical Society)  
LC50: Lethal concentration, 50 percent  
LD50: Lethal dose, 50 percent  
Press. Gas: Gases under pressure: Compressed gas

**Sources**

Website, European Chemicals Agency (<http://http://echa.europa.eu/>)  
Website, US EPA Substance Registry Services ([http://http://ofmpub.epa.gov/sor\\_internet/registry/substreg/home/overview/home.do](http://http://ofmpub.epa.gov/sor_internet/registry/substreg/home/overview/home.do))  
Website, Chemical Abstracts Registry, American Chemical Society (<https://www.cas.org>)  
Patty's Industrial Hygiene, 6th ed., Rose, Vernon, ed. ISBN: ISBN: 978-0-470-07488-6  
Casarett and Doull's Toxicology: The Basic Science of Poisons, 8th Ed., Klaasen, Curtis D., ed., ISBN: 978-0-07-176923-5.  
Safety Data Sheets, Individual Manufacturers  
SDS Prepared by:  
ChemTel Inc.  
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