Carbon Monoxide (0.1000% - 0.9999%), Helium (0.0001% - 80.3999%), Oxygen (19.50% - 23.50%) in Nitrogen

Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
Date of issue: 04/20/2015 Supersedes: 11/17/2014 Version: 2.0

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
Product form: Mixture
Product name: Carbon Monoxide (0.1000% - 0.9999%), Helium (0.0001% - 80.3999%), Oxygen (19.50% - 23.50%) in Nitrogen
Product code: SG-2004-03194
Other means of identification: SG Lung Diffusion Gas

1.2. Relevant identified uses of the substance or mixture and uses advised against
Use of the substance/mixture: Respiratory diagnosis monitoring and calibration gas.
Use of the substance/mixture: Test gas/Calibration gas.

1.3. Details of the supplier of the safety data sheet
Air Liquide
2700 Post Oak Boulevard
Houston, TX 77056 - USA
T 1-800-819-1704
www.us.airliquide.com

1.4. Emergency telephone number
Emergency number: CHEMTREC: 1-800-424-9300

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
Classification (GHS-US)
Compressed gas: H280
Repr. 1A: H360
Full text of H-phrases: see section 16

2.2. Label elements
GHS-US labeling
Hazard pictograms (GHS-US): 

GHS04  GHS08

Signal word (GHS-US): Danger
Hazard statements (GHS-US): 
H280 - Contains gas under pressure; may explode if heated
H360 - May damage fertility or the unborn child
CGA-HG10 - Asphyxiating even with adequate oxygen
CGA-HG24 - Supports combustion.

Precautionary statements (GHS-US): 
P202 - Do not handle until all safety precautions have been read and understood
P260 - Do not breathe gas
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear eye protection, face protection, protective gloves, protective clothing
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P308+P313 - If exposed or concerned: Get medical advice/attention
P403 - Store in a well-ventilated place
P405 - Store locked up
P501 - Dispose of contents/container in accordance with local/regional/national/international regulations
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)
CGA-PG05 - Use a back flow preventive device in the piping
CGA-PG06 - Close valve after each use and when empty
CGA-PG10 - Use only with equipment rated for cylinder pressure
CGA-PG14 - Approach suspected leak area with caution
2.3. Other hazards

Other hazards not contributing to the classification: This product contains a chemical asphyxiant.

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>Classification (GHS-US)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>(CAS No) 7727-37-9</td>
<td>0.0001 -</td>
<td>Compressed gas, H280</td>
</tr>
<tr>
<td></td>
<td></td>
<td>80.3999</td>
<td></td>
</tr>
<tr>
<td>Helium</td>
<td>(CAS No) 7440-59-7</td>
<td>0.0001 -</td>
<td>Compressed gas, H280</td>
</tr>
<tr>
<td></td>
<td></td>
<td>80.3999</td>
<td></td>
</tr>
<tr>
<td>Oxygen</td>
<td>(CAS No) 7782-44-7</td>
<td>19.5 - 23.5</td>
<td>Ox. Gas 1, H270</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>(CAS No) 630-08-0</td>
<td>0.1 - 0.9999</td>
<td>Flam. Gas 1, H220, Compressed gas, H280, Acute Tox. 3 (inhalation:gas), H331, Repr. 1A, H360, STOT RE 1, H372</td>
</tr>
</tbody>
</table>

Full text of H-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.

First-aid measures after skin contact: Adverse effects not expected from this product.

First-aid measures after eye contact: Adverse effects not expected from this product.

First-aid measures after ingestion: Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation: Asphyxiating even with adequate oxygen.

Symptoms/injuries after skin contact: Adverse effects not expected from this product.

Symptoms/injuries after eye contact: Adverse effects not expected from this product.

Symptoms/injuries after ingestion: Ingestion is not considered a potential route of exposure.

Symptoms/injuries upon intravenous administration: Not known.

Chronic symptoms: May damage fertility. May damage the unborn child.

4.3. Indication of any immediate medical attention and special treatment needed

If you feel unwell, seek medical advice. If breathing is difficult, give oxygen. Obtain medical attention if breathing difficulty persists.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Use extinguishing media appropriate for surrounding fire.

Unsuitable extinguishing media: Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

Fire hazard: The product is not flammable.

Explosion hazard: Product is not explosive. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.

Reactivity: None known.

5.3. Advice for firefighters

Firefighting instructions: In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire.
Protection during firefighting: Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures: Ensure adequate ventilation.

6.1.1. For non-emergency personnel

Protective equipment: Wear protective equipment consistent with the site emergency plan.

6.1.2. For emergency responders

Protective equipment: Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Equip cleanup crew with proper protection.
Emergency procedures: Evacuate and limit access. Ventilate area.

6.2. Environmental precautions

Try to stop release if safe to do so.

6.3. Methods and material for containment and cleaning up

For containment: Try to stop release if safe to do so.
Methods for cleaning up: Dispose of this material and its container in accordance with local regulations.

6.4. Reference to other sections

See also Sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed: Pressurized container: Do not pierce or burn, even after use. Use equipment rated for cylinder pressure. Close valve after each use and when empty.
Precautions for safe handling: Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area.
Hygiene measures: Do not eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures: Comply with applicable regulations.
Storage conditions: Do not expose to temperatures exceeding 52°C (125°F). Keep container closed when not in use. Protect cylinder from physical damage. Store in well ventilated area. Store locked up.
Incompatible products: None known.
Incompatible materials: Flammable materials.

7.3. Specific end use(s)

See Section 1.2.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Carbon Monoxide (0.1000% - 0.9999%), Helium (0.0001% - 80.3999%), Oxygen (19.50% - 23.50%) in Nitrogen</th>
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<td>OSHA</td>
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<th>Nitrogen (7727-37-9)</th>
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</thead>
<tbody>
<tr>
<td>ACGIH</td>
</tr>
</tbody>
</table>
## SECTION 8: Exposure controls

### Appropriate engineering controls

Ensure exposure is below occupational exposure limits. Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leakages. Consider work permit system e.g. for maintenance activities. Alarm detectors should be used when toxic gases may be released.

### Hand protection


### Eye protection


### Skin and body protection

Wear suitable protective clothing, e.g. - lab coats, coveralls or flame resistant clothing.

### Respiratory protection

None necessary during normal and routine operations. See Sections 5 & 6.

### Thermal hazard protection

None necessary during normal and routine operations.

### Environmental exposure controls

Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

### Other information


## SECTION 9: Physical and chemical properties

### Physical state

Gas

### Appearance

Clear, colorless gas.

### Color

Colorless

### Odor

Odorless

### Odor threshold

No Data Available

### pH

Not applicable.

### Melting point

No Data Available

### Freezing point

No data available

### Boiling point

No Data Available

### Flash point

No Data Available

### Relative evaporation rate (butyl acetate=1)

No data available

### Relative evaporation rate (ether=1)

Not applicable for gas-mixtures.

### Flammability (solid, gas)

See Section 2.1 and 2.2

### Explosion limits

Not applicable - not flammable

### Explosive properties

Not applicable - not flammable.

### Oxidizing properties

Supports combustion.

### Vapor pressure

Not applicable.

### Relative density

No data available

### Relative vapor density at 20 °C

No data available.

### Molecular mass

Not applicable for gas-mixtures.

### Relative gas density

Lighter or similar to air.

### Solubility

No data available

### Log Pow

No data available

### Log Kow

No data available

### Auto-ignition temperature

No data available

### Decomposition temperature

No data available
Carbon Monoxide (0.1000% - 0.9999%), Helium (0.0001% - 80.3999%), Oxygen (19.50% - 23.50%) in Nitrogen

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### Viscosity
- No data available
- Not applicable.
- Not applicable

### 9.2. Other information
No additional information available

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity
None known.

#### 10.2. Chemical stability
Stable under normal conditions.

#### 10.3. Possibility of hazardous reactions
Can form explosive mixtures with flammable materials.

#### 10.4. Conditions to avoid
None under recommended storage and handling conditions (see section 7).

#### 10.5. Incompatible materials
Flammable materials.

#### 10.6. Hazardous decomposition products
Under normal conditions of storage and use hazardous decomposition products should not be produced.

### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

**Likely routes of exposure**
- Inhalation

**Acute toxicity**
- Not classified

**Carbon monoxide (630-08-0)**
- LC50 inhalation rat (ppm): 1880 ppm/4h
- ATE US (gases): 1880.000 ppmV/4h

**Nitrogen (7727-37-9)**
- LC50 inhalation rat (ppm): 820000 ppm/4h

**Oxygen (7782-44-7)**
- LC50 inhalation rat (ppm): 800000 ppm/4h

**Helium (7440-59-7)**
- LC50 inhalation rat (ppm): 820000 ppm/4h

**Skin corrosion/irritation**
- Not classified
  - pH: Not applicable.

**Serious eye damage/irritation**
- Not classified
  - pH: Not applicable.

**Respiratory or skin sensitization**
- Not classified

**Germ cell mutagenicity**
- Not classified

**Carcinogenicity**
- Not classified

**Reproductive toxicity**
- May damage fertility or the unborn child.

**Specific target organ toxicity (single exposure)**
- Not classified

**Specific target organ toxicity (repeated exposure)**
- Not classified

**Aspiration hazard**
- Not classified

**Symptoms/injuries after inhalation**
- Asphyxiating even with adequate oxygen.
Carbon Monoxide (0.1000% - 0.9999%), Helium (0.0001% - 80.3999%), Oxygen (19.50% - 23.50%) in Nitrogen

Safety Data Sheet

Symptoms/injuries after skin contact: Adverse effects not expected from this product.
Symptoms/injuries after eye contact: Adverse effects not expected from this product.
Symptoms/injuries after ingestion: Ingestion is not considered a potential route of exposure.
Symptoms/injuries upon intravenous administration: Not known.
Chronic symptoms: May damage fertility. May damage the unborn child.

SECTION 12: Ecological information

12.1. Toxicity
No additional information available

12.2. Persistence and degradability

<table>
<thead>
<tr>
<th>Compound</th>
<th>Persistence and degradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon monoxide (630-08-0)</td>
<td>Will not undergo hydrolysis. Not readily biodegradable. Not applicable for inorganic gases.</td>
</tr>
<tr>
<td>Nitrogen (7727-37-9)</td>
<td>No ecological damage caused by this product.</td>
</tr>
<tr>
<td>Oxygen (7782-44-7)</td>
<td>No ecological damage caused by this product.</td>
</tr>
<tr>
<td>Helium (7440-59-7)</td>
<td>No ecological damage caused by this product.</td>
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</table>

12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Compound</th>
<th>Log Pow</th>
<th>Bioaccumulative potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon monoxide (630-08-0)</td>
<td>1.78</td>
<td>Not expected to bioaccumulate due to the low log Kow (log Kow &lt; 4). Refer to section 9.</td>
</tr>
<tr>
<td>Nitrogen (7727-37-9)</td>
<td></td>
<td>Not applicable for inorganic gases.</td>
</tr>
<tr>
<td>Oxygen (7782-44-7)</td>
<td></td>
<td>No ecological damage caused by this product.</td>
</tr>
<tr>
<td>Helium (7440-59-7)</td>
<td></td>
<td>No ecological damage caused by this product.</td>
</tr>
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</table>

12.4. Mobility in soil

<table>
<thead>
<tr>
<th>Compound</th>
<th>Ecology - soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon monoxide (630-08-0)</td>
<td>Because of its high volatility, the product is unlikely to cause ground or water pollution.</td>
</tr>
<tr>
<td>Nitrogen (7727-37-9)</td>
<td>No ecological damage caused by this product.</td>
</tr>
<tr>
<td>Oxygen (7782-44-7)</td>
<td>No ecological damage caused by this product.</td>
</tr>
<tr>
<td>Helium (7440-59-7)</td>
<td>No ecological damage caused by this product.</td>
</tr>
</tbody>
</table>

12.5. Other adverse effects

| Effect on ozone layer | : No known effects from this product. |
| Effect on the global warming | : Contains greenhouse gas(es) not covered by 842/2006/EC. |
SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods: Contact supplier if guidance is required. Do not discharge into any place where its accumulation could be dangerous. Ensure that the emission levels from local regulations or operating permits are not exceeded.

Waste disposal recommendations: Refer to the CGA Pamphlet P-63 "Disposal of Gases" available at www.cganet.com for more guidance on suitable disposal methods.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description: UN1956 Compressed gas, n.o.s.

UN-No.(DOT): UN1956

Proper Shipping Name (DOT): Compressed gas, n.o.s.

Hazard labels (DOT): 2.2 - Non-flammable gas

DOT Symbols: G - Identifies PSN requiring a technical name

DOT Packaging Non Bulk (49 CFR 173.xxx): 302;305

DOT Packaging Bulk (49 CFR 173.xxx): 314;315

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27): 75 kg

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75): 150 kg

DOT Vessel Stowage Location: A - The material may be stowed “on deck” or “under deck” on a cargo vessel and on a passenger vessel.

Additional information

Other information: No supplementary information available.

ADR

Transport document description: UN 1956, 2.2, (E)

Class (ADR): 2 - Gases

Hazard identification number (Kemler No.): 20

Classification code (ADR): 1A

Hazard labels (ADR): 2.2 - Non-flammable compressed gas

Orange plates:

Tunnel restriction code (ADR): E

Limited quantities (ADR): 120ml

Excepted quantities (ADR): E1

Transport by sea

UN-No. (IMDG): 1956
Carbon Monoxide (0.1000% - 0.9999%), Helium (0.0001% - 80.3999%), Oxygen (19.50% - 23.50%) in Nitrogen

Safety Data Sheet

Proper Shipping Name (IMDG) : COMPRESSED GAS, N.O.S.
Class (IMDG) : 2 - Gases

Air transport
UN-No.(IATA) : 1956
Proper Shipping Name (IATA) : COMPRESSED GAS, N.O.S.
Class (IATA) : 2

SECTION 15: Regulatory information

15.1. US Federal regulations
Carbon monoxide (630-08-0)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Nitrogen (7727-37-9)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Oxygen (7782-44-7)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Helium (7440-59-7)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations
CANADA
Carbon monoxide (630-08-0)
Listed on the Canadian DSL (Domestic Sustances List)
WHMIS Classification
Class A - Compressed Gas
Class B Division 1 - Flammable Gas
Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects
Class D Division 2 Subdivision A - Very toxic material causing other toxic effects
Nitrogen (7727-37-9)
Listed on the Canadian DSL (Domestic Sustances List)
WHMIS Classification
Class A - Compressed Gas
Oxygen (7782-44-7)
Listed on the Canadian DSL (Domestic Sustances List)
WHMIS Classification
Class A - Compressed Gas
Class C - Oxidizing Material
Helium (7440-59-7)
Listed on the Canadian DSL (Domestic Sustances List)
WHMIS Classification
Class A - Compressed Gas

EU-Regulations
Carbon monoxide (630-08-0)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Nitrogen (7727-37-9)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Oxygen (7782-44-7)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Helium (7440-59-7)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Classification according to Regulation (EC) No. 1272/2008 [CLP]
Not classified

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]
No additional information available
Carbon Monoxide (0.1000% - 0.9999%), Helium (0.0001% - 80.3999%), Oxygen (19.50% - 23.50%) in Nitrogen

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

National regulations

<table>
<thead>
<tr>
<th>Carbon monoxide (630-08-0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the AICS (Australian Inventory of Chemical Substances)</td>
</tr>
<tr>
<td>Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)</td>
</tr>
<tr>
<td>Listed on the Japanese ENCS (Existing &amp; New Chemical Substances) inventory</td>
</tr>
<tr>
<td>Listed on the Korean ECL (Existing Chemicals List)</td>
</tr>
<tr>
<td>Listed on NZIoC (New Zealand Inventory of Chemicals)</td>
</tr>
<tr>
<td>Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)</td>
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15.3. US State regulations

<table>
<thead>
<tr>
<th>Carbon monoxide (630-08-0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - California - Proposition 65 - Carcinogens List</td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Developmental Toxicity</td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Reproductive Toxicity - Female</td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</td>
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<td>U.S. - Massachusetts - Right To Know List</td>
</tr>
<tr>
<td>U.S. - New Jersey - Right to Know Hazardous Substance List</td>
</tr>
<tr>
<td>U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List</td>
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SECTION 16: Other information

Indication of changes : Revised safety data sheet in accordance with OSHA final rule on GHS implementation promulgated March 26, 2012.
Carbon Monoxide (0.1000% - 0.9999%), Helium (0.0001% - 80.3999%), Oxygen (19.50% - 23.50%) in Nitrogen

Safety Data Sheet

Other information: This Safety Data Sheet is offered pursuant to OSHA’s Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product.

Full text of H-phrases:

<table>
<thead>
<tr>
<th>Acute Tox. 3 (Inhalation:gas)</th>
<th>Acute toxicity (inhalation:gas) Category 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressed gas</td>
<td>Gases under pressure Compressed gas</td>
</tr>
<tr>
<td>Flam. Gas 1</td>
<td>Flammable gases Category 1</td>
</tr>
<tr>
<td>Ox. Gas 1</td>
<td>Oxidizing gases Category 1</td>
</tr>
<tr>
<td>Repr. 1A</td>
<td>Reproductive toxicity Category 1A</td>
</tr>
<tr>
<td>STOT RE 1</td>
<td>Specific target organ toxicity (repeated exposure) Category 1</td>
</tr>
<tr>
<td>H220</td>
<td>Extremely flammable gas</td>
</tr>
<tr>
<td>H270</td>
<td>May cause or intensify fire; oxidizer</td>
</tr>
<tr>
<td>H280</td>
<td>Contains gas under pressure; may explode if heated</td>
</tr>
<tr>
<td>H331</td>
<td>Toxic if inhaled</td>
</tr>
<tr>
<td>H360</td>
<td>May damage fertility or the unborn child</td>
</tr>
<tr>
<td>H372</td>
<td>Causes damage to organs through prolonged or repeated exposure</td>
</tr>
</tbody>
</table>

SDS US (GHS HazCom 2012)

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