**Safety Data Sheet**

## Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

### 1.1 Product identifier

**Product Name** • **Hydrogen (1 - 5.5%), Carbon Dioxide (1 - 10%), Nitrogen (Balance)**

**Product Code** • M-4712E-1

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

**Relevant identified use(s)** • Please provide product use.

### 1.3 Details of the supplier of the safety data sheet

**Manufacturer** • Air Liquide

2700 Post Oak Blvd.
Houston, TX 77056
United States
www.us.airliquide.com
sds@airliquide.com

**Telephone (Technical)** • 713-896-2896

**Telephone (Technical)** • 800-819-1704

### 1.4 Emergency telephone number

**Manufacturer** • 800-424-9300 - CHEMTREC

**Manufacturer** • +1 703-527-3887 - Outside United States

## Section 2: Hazards Identification

### EU/EEC

**According to Regulation (EC) No 1272/2008 (CLP)/REACH 1907/2006 [amended by 453/2010]**
**According to EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)**

### 2.1 Classification of the substance or mixture

**CLP** • Compressed Gas - H280

**DSD/DPD** • Not classified - Classification criteria not met

### 2.2 Label Elements

**CLP**

**WARNING**

**Hazard statements** • H280 - Contains gas under pressure; may explode if heated

**Precautionary statements**

**Prevention** • P210 - Keep away from heat, sparks, open flames and/or hot surfaces. - No smoking.

**Response** • P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - Eliminate all ignition sources if safe to do so.

**Storage/Disposal** • Protect from sunlight when ambient temperature exceeds 125°F (52°C)
P403 - Store in a well-ventilated place.

**DSD/DPD**

**Risk phrases** • No label element(s) required

### 2.3 Other Hazards

**CLP** • Mixtures containing carbon dioxide can increase respiration and heart rate.
This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces.
Contact with rapidly expanding gas may cause burns or frostbite.
According to Regulation (EC) No. 1272/2008 (CLP) this material is considered hazardous.

**DSD/DPD** • Mixtures containing carbon dioxide can increase respiration and heart rate.
This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces.
Contact with rapidly expanding gas may cause burns or frostbite.
This product is not considered dangerous under the European Directive 67/548/EEC

## United States (US)

**According to OSHA 29 CFR 1910.1200 HCS**

### 2.1 Classification of the substance or mixture

**OSHA HCS 2012** • Compressed Gas - H280
Simple Asphyxiant

### 2.2 Label elements

**OSHA HCS 2012**

**WARNING**

**Hazard statements** • Contains gas under pressure; may explode if heated - H280
May displace oxygen and cause rapid suffocation.

**Precautionary statements**

**Prevention** • Keep away from heat, sparks, open flames and/or hot surfaces. - No smoking. - P210

**Response** • Leaking gas fire: Do not extinguish, unless leak can be stopped safely. - P377
Eliminate all ignition sources if safe to do so. - P381

**Storage/Disposal** • Protect from sunlight when ambient temperature exceeds 125°F (52°C)
Store in a well-ventilated place. - P403

### 2.3 Other hazards

**OSHA HCS 2012** • Mixtures containing carbon dioxide can increase respiration and heart rate. Contact with rapidly expanding gas may cause burns or frostbite. Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

## Canada

**According to WHMIS**

### 2.1 Classification of the substance or mixture

**WHMIS** • Compressed Gas - A

### 2.2 Label elements

**WHMIS**

- Compressed Gas - A

## 2.3 Other hazards

**WHMIS**

- Mixtures containing carbon dioxide can increase respiration and heart rate.
  This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces.
  Contact with rapidly expanding gas may cause burns or frostbite.
  In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

## 2.4 Other information

**NFPA**


# Section 3 - Composition/Information on Ingredients

## 3.1 Substances

- Material does not meet the criteria of a substance in accordance with Regulation (EC) No 1272/2008.

## 3.2 Mixtures

| Composition | | | | |
|---|---|---|---|---|
| **Chemical Name** | **Identifiers** | **%** | **LD50/LC50** | **Classifications According to Regulation/Directive** |
| Nitrogen | **CAS:**7727-37-9<br>**EINECS:**231-783-9 | Balance | NDA | **EU DSD/DPD:** Not Classified<br>**EU CLP:** Self Classified - Press. Gas - Comp., H280<br>**OSHA HCS 2012:** Press. Gas - Comp.; Simp. Asphyx. |
| Hydrogen | **CAS:**1333-74-0<br>**EC Number:**215-605-7<br>**EU Index:**001-001-00-9 | 1% TO 5.5% | NDA | **EU DSD/DPD:** Annex I - F+; R12<br>**EU CLP:** Annex VI - Flam. Gas 1, H220; Press. Gas - Comp., H280<br>**OSHA HCS 2012:** Flam. Gas 1; Press. Gas - Comp.; Simp. Asphyx. |
| Carbon dioxide | **CAS:**124-38-9<br>**EC Number:**204-696-9 | 1% TO 10% | Inhalation-Rat LC50 • 470000 ppm 30 Minute(s) | **EU DSD/DPD:** Not Classified<br>**EU CLP:** Self Classified - Press. Gas - Comp., H280<br>**OSHA HCS 2012:** Press. Gas - Comp.; Simp. Asphyx. |

*See Section 16 for full text of H-statements and R-phrases.*

## Section 4 - First Aid Measures

### 4.1 Description of first aid measures

**Inhalation**
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. If signs/symptoms continue, get medical attention.

**Skin**
- If frostbite has occurred, seek medical attention immediately; do NOT rub the affected area(s) or flush them with water. In order to prevent further tissue damage, do NOT attempt to remove frozen clothing from frostbitten areas. If frostbite has not occurred, immediately and thoroughly wash contaminated skin with soap and water.

**Eye**
- If eye tissue is frozen, seek medical attention immediately; if tissue is not frozen, immediately and thoroughly flush the eyes with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation, pain, swelling, lacrimation or photophobia persist, get medical attention as soon as possible.

**Ingestion**
- If frostbite has occurred, seek medical attention immediately; do NOT rub the affected area(s) or flush them with water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting.

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

- Refer to Section 11 - Toxicological Information.

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

**Notes to Physician**
- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

### 4.4 Other information

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO GASES WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn. Victim(s) who experience any adverse effect after over-exposure to this gas mixture must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

## Section 5 - Firefighting Measures

### 5.1 Extinguishing media

**Suitable Extinguishing Media**
- Use extinguishing agent suitable for type of surrounding fire.
  SMALL FIRES: Dry chemical or CO2.
  LARGE FIRES: Water spray or fog.

**Unsuitable Extinguishing Media**
- No data available

### 5.2 Special hazards arising from the substance or mixture

**Unusual Fire and Explosion Hazards**
- Containers may explode when heated.
  Ruptured cylinders may rocket.

**Hazardous Combustion Products**
- No data available

### 5.3 Advice for firefighters

- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
  Wear positive pressure self-contained breathing apparatus (SCBA).
  Move containers from fire area if you can do it without risk.
  FIRE: If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all

directions.
FIRE INVOLVING TANKS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
FIRE INVOLVING TANKS: Cool containers with flooding quantities of water until well after fire is out.
FIRE INVOLVING TANKS: Do not direct water at source of leak or safety devices; icing may occur.
FIRE INVOLVING TANKS: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
FIRE INVOLVING TANKS: ALWAYS stay away from tanks engulfed in fire.

## Section 6 - Accidental Release Measures

### 6.1 Personal precautions, protective equipment and emergency procedures

**Personal Precautions**

- Ventilate the area before entry. Do not walk through spilled material. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

**Emergency Procedures**

- Keep unauthorized personnel away. Keep out of low areas. Stay upwind. Do not direct water at spill or source of leak. LARGE SPILL: Consider initial downwind evacuation for at least 500 meters (1/3 mile)

### 6.2 Environmental precautions

- No special environmental precautions necessary.

### 6.3 Methods and material for containment and cleaning up

**Containment/Clean-up Measures**

- Stop leak if you can do it without risk.
Ventilate the area.
Allow substance to evaporate.
If possible, turn leaking containers so that gas escapes rather than liquid.
Use water spray to reduce vapors; do not put water directly on leak, spill area or inside container.
Isolate area until gas has dispersed.

### 6.4 Reference to other sections

- Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

## Section 7 - Handling and Storage

### 7.1 Precautions for safe handling

**Handling**

- Use only with adequate ventilation. Ventilate closed spaces before entering. Be aware of any signs of dizziness or fatigue, especially if work is done in a poorly ventilated area; exposures to fatal concentrations of this gas mixture could occur without any significant warning symptoms, due to olfactory fatigue or oxygen deficiency. Cylinders should be firmly secured to prevent falling or being knocked-over. Do not attempt to repair, adjust, or in any other way modify cylinders. If there is a malfunction or another type of operational problem, contact nearest distributor immediately. Empty containers retain product residue and can be hazardous. Do not cut, weld, puncture or incinerate container.

### 7.2 Conditions for safe storage, including any incompatibilities

**Storage**

- Store in a cool, dry, well-ventilated place. Protect cylinders against physical damage. Cylinders should be firmly secured to prevent falling or being knocked-over. Do not allow area where cylinders are stored to exceed 52C (125F).

### 7.3 Specific end use(s)

- Refer to Section 1.2 - Relevant identified uses.

## Section 8 - Exposure Controls/Personal Protection

## 8.1 Control parameters

| Exposure Limits/Guidelines | | | | | | |
|---|---|---|---|---|---|---|
| | **Result** | **ACGIH** | **Canada Ontario** | **Canada Quebec** | **China** | **Europe** |
| Carbon dioxide (124-38-9) | TWAs | 5000 ppm TWA | 5000 ppm TWA | 5000 ppm TWAEV; 9000 mg/m3 TWAEV | 9000 mg/m3 TWA | 5000 ppm TWA; 9000 mg/m3 TWA |
| | STELs | 30000 ppm STEL | 30000 ppm STEL | 30000 ppm STEV; 54000 mg/m3 STEV | 18000 mg/m3 STEL | Not established |

| Exposure Limits/Guidelines (Con't.) | | | | | | |
|---|---|---|---|---|---|---|
| | **Result** | **France** | **Germany DFG** | **Germany TRGS** | **Ireland** | **Israel** |
| Carbon dioxide (124-38-9) | TWAs | 5000 ppm TWA [VME] (indicative limit); 9000 mg/m3 TWA [VME] (indicative limit) | Not established | 5000 ppm TWA AGW (exposure factor 2); 9100 mg/m3 TWA AGW (exposure factor 2) | 5000 ppm TWA; 9000 mg/m3 TWA | 5000 ppm TWA |
| | STELs | Not established | Not established | Not established | Not established | 30000 ppm STEL |
| | Ceilings | Not established | 10000 ppm Peak; 18200 mg/m3 Peak | Not established | Not established | Not established |
| | MAKs | Not established | 5000 ppm TWA MAK; 9100 mg/m3 TWA MAK | Not established | Not established | Not established |

| Exposure Limits/Guidelines (Con't.) | | | | | | |
|---|---|---|---|---|---|---|
| | **Result** | **Italy** | **NIOSH** | **OSHA** | **OSHA Vacated** | **Portugal** |
| Carbon dioxide (124-38-9) | STELs | Not established | 30000 ppm STEL; 54000 mg/m3 STEL | Not established | 30000 ppm STEL; 54000 mg/m3 STEL | 30000 ppm STEL [VLE-CD |
| | TWAs | 5000 ppm TWA; 9000 mg/m3 TWA | 5000 ppm TWA; 9000 mg/m3 TWA | 5000 ppm TWA; 9000 mg/m3 TWA | 10000 ppm TWA; 18000 mg/m3 TWA | 5000 ppm TWA [VLE-MP] |

| Exposure Limits/Guidelines (Con't.) | | | |
|---|---|---|---|
| | **Result** | **Spain** | **Sweden** |
| Carbon dioxide (124-38-9) | TWAs | 5000 ppm TWA [VLA-ED] (indicative limit value); 9150 mg/m3 TWA [VLA-ED] (indicative limit value) | 5000 ppm LLV; 9000 mg/m3 LLV |
| | STELs | Not established | 10000 ppm STV; 18000 mg/m3 STV |

### Exposure Control Notations

**Portugal**

•Nitrogen (7727-37-9): **Simple Asphyxiants:** (Simple Asphyxiant)

•Hydrogen (1333-74-0): **Simple Asphyxiants:** (Simple Asphyxiant)

**Ireland**

•Nitrogen (7727-37-9): **Simple Asphyxiants:** (Asphyxiant)

•Hydrogen (1333-74-0): **Simple Asphyxiants:** (Asphyxiant)

**Spain**

•Nitrogen (7727-37-9): **Simple Asphyxiants:** (simple asphyxiant)

•Hydrogen (1333-74-0): **Simple Asphyxiants:** (simple asphyxiant)

## 8.2 Exposure controls

**Engineering Measures/Controls**

- Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable

level.

**Personal Protective Equipment**

**Respiratory**
- In case of insufficient ventilation, wear suitable respiratory equipment. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.

**Eye/Face**
- Wear safety glasses.

**Skin/Body**
- Wear leather gloves when handling cylinders.

**Environmental Exposure Controls**
- Follow best practice for site management and disposal of waste. Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

**Key to abbreviations**

ACGIH = American Conference of Governmental Industrial Hygiene

LLV = Limit Level Value is the exposure limit for 8-hour work day

MAK = Maximale Arbeitsplatz Konzentration is the maximum permissible concentration

NIOSH = National Institute of Occupational Safety and Health

OSHA = Occupational Safety and Health Administration

STEL = Short Term Exposure Limits are based on 15-minute exposures

STEV = Short Term Exposure Value

TWAEV = Time-Weighted Average Exposure Value

TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

## Section 9 - Physical and Chemical Properties

### 9.1 Information on Physical and Chemical Properties

| | | | |
|---|---|---|---|
| **Material Description** | | | |
| Physical Form | Gas | Appearance/Description | Colorless compressed gas with no odor. |
| Color | Colorless | Odor | Odorless |
| Odor Threshold | Not relevant | | |
| **General Properties** | | | |
| Boiling Point | -195.8 C(-320.44 F)<br>Nitrogen | Melting Point | -210 C(-346 F)<br>Nitrogen |
| Decomposition Temperature | Data lacking | pH | Not relevant |
| Specific Gravity/Relative Density | Data lacking | Water Solubility | 0.023 % @ 0 C(32 F)<br>Nitrogen |
| Viscosity | Data lacking | Explosive Properties | Data lacking |
| Oxidizing Properties: | Data lacking | | |
| **Volatility** | | | |
| Vapor Pressure | Data lacking | Vapor Density | 0.906 Air=1<br>Nitrogen |
| Evaporation Rate | Not relevant | | |
| **Flammability** | | | |
| Flash Point | Not relevant | UEL | Not relevant |
| LEL | Not relevant | Autoignition | Not relevant |
| Flammability (solid, gas) | Flammable gas. | | |
| **Environmental** | | | |
| Octanol/Water Partition coefficient | Not relevant | | |

### 9.2 Other Information

- No additional physical and chemical parameters noted.

## Section 10: Stability and Reactivity

### 10.1 Reactivity

- No dangerous reaction known under conditions of normal use.

### 10.2 Chemical stability

- Stable under normal temperatures and pressures.

### 10.3 Possibility of hazardous reactions

- Hazardous polymerization will not occur.

### 10.4 Conditions to avoid

- Excess heat.

### 10.5 Incompatible materials

- Oxidizing agents. Nitrogen reacts with Li, Nd, and Ti at high temperatures. This weakly acidic material will react with alkaline materials to form carbonates and bicarbonates.

### 10.6 Hazardous decomposition products

- None known.

## Section 11 - Toxicological Information

### 11.1 Information on toxicological effects

| Components | | |
|---|---|---|
| Carbon dioxide (1% TO 10%) | 124-38-9 | **Acute Toxicity:** Inhalation-Rat LC50 • 470000 ppm 30 Minute(s); **Reproductive:** Inhalation-Rat TCLo • 6 pph 24 Hour(s)(10D preg); *Reproductive Effects:Specific Developmental Abnormalities*:**Musculoskeletal system**; *Reproductive Effects:Specific Developmental Abnormalities*:**Cardiovascular (circulatory) system**; *Reproductive Effects:Specific Developmental Abnormalities*:**Respiratory system** |

| GHS Properties | Classification |
|---|---|
| **Acute toxicity** | **EU/CLP** • Classification criteria not met<br>**OSHA HCS 2012** • Classification criteria not met |
| **Aspiration Hazard** | **EU/CLP** • Classification criteria not met<br>**OSHA HCS 2012** • Classification criteria not met |
| **Carcinogenicity** | **EU/CLP** • Classification criteria not met<br>**OSHA HCS 2012** • Classification criteria not met |
| **Germ Cell Mutagenicity** | **EU/CLP** • Classification criteria not met<br>**OSHA HCS 2012** • Classification criteria not met |
| **Skin corrosion/Irritation** | **EU/CLP** • Classification criteria not met<br>**OSHA HCS 2012** • Classification criteria not met |
| **Skin sensitization** | **EU/CLP** • Classification criteria not met<br>**OSHA HCS 2012** • Classification criteria not met |
| **STOT-RE** | **EU/CLP** • Classification criteria not met<br>**OSHA HCS 2012** • Classification criteria not met |
| **STOT-SE** | **EU/CLP** • Classification criteria not met<br>**OSHA HCS 2012** • Classification criteria not met |

| | |
|---|---|
| **Toxicity for Reproduction** | **EU/CLP** • Classification criteria not met<br>**OSHA HCS 2012** • Classification criteria not met |
| **Respiratory sensitization** | **EU/CLP** • Classification criteria not met<br>**OSHA HCS 2012** • Classification criteria not met |
| **Serious eye damage/Irritation** | **EU/CLP** • Classification criteria not met<br>**OSHA HCS 2012** • Classification criteria not met |

## Potential Health Effects

### Inhalation

**Acute (Immediate)**
- This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces. If this material is released in a small, poorly ventilated area (i.e. an enclosed or confined space), an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The following effects associated with decreased levels of oxygen: increase in breathing and pulse rate, emotional upset, abnormal fatigue, nausea, vomiting, collapse, loss of consciousness, convulsive movements, respiratory collapse and death. Inhalation of carbon dioxide can increase respiration and heart rate.

**Chronic (Delayed)**
- No data available

### Skin

**Acute (Immediate)**
- Contact with gas or liquefied gas will cause burns, severe injury and/or frostbite.

**Chronic (Delayed)**
- No data available

### Eye

**Acute (Immediate)**
- Contact with gas or liquefied gas will cause burns, severe injury and/or frostbite.

**Chronic (Delayed)**
- No data available

### Ingestion

**Acute (Immediate)**
- Ingestion can cause burns similar to frostbite.

**Chronic (Delayed)**
- No data available

**Key to abbreviations**

LC = Lethal Concentration

TC = Toxic Concentration

## Section 12 - Ecological Information

### 12.1 Toxicity

- Material data lacking.

### 12.2 Persistence and degradability

- Material data lacking.

### 12.3 Bioaccumulative potential

- Material data lacking.

### 12.4 Mobility in Soil

- Material data lacking.

### 12.5 Results of PBT and vPvB assessment

- PBT and vPvB assessment has not been conducted for this material.

### 12.6 Other adverse effects

- No studies have been found.

## Section 13 - Disposal Considerations

### 13.1 Waste treatment methods

**Product waste**
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

**Packaging waste**
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

## Section 14 - Transport Information

| | 14.1 UN number | 14.2 UN proper shipping name | 14.3 Transport hazard class(es) | 14.4 Packing group | 14.5 Environmental hazards |
|---|---|---|---|---|---|
| **DOT** | UN1956 | Compressed gas, n.o.s. (Nitrogen, Carbon dioxide, Hydrogen) | 2.2 | NDA | NDA |
| **TDG** | UN1956 | COMPRESSED GAS, N.O.S. (Nitrogen, Carbon dioxide, Hydrogen) | 2.2 | NDA | NDA |
| **IMO/IMDG** | UN1956 | COMPRESSED GAS, N.O.S. (Nitrogen, Carbon dioxide, Hydrogen) | 2.2 | NDA | NDA |
| **IATA/ICAO** | UN1956 | Compressed gas, n.o.s. (Nitrogen, Carbon dioxide, Hydrogen) | 2.2 | NDA | NDA |

**14.6 Special precautions for user**
- Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

**14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**
- Not relevant.

## Section 15 - Regulatory Information

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

**SARA Hazard Classifications**
- Acute, Pressure(Sudden Release of)

| State Right To Know | | | | |
|---|---|---|---|---|
| **Component** | **CAS** | **MA** | **NJ** | **PA** |
| Carbon dioxide | 124-38-9 | Yes | Yes | Yes |
| Hydrogen | 1333-74-0 | Yes | Yes | Yes |
| Nitrogen | 7727-37-9 | Yes | Yes | Yes |

| Inventory | | | | | | |
|---|---|---|---|---|---|---|
| **Component** | **CAS** | **Canada DSL** | **Canada NDSL** | **China** | **EU EINECS** | **EU ELNICS** |
| Carbon dioxide | 124-38-9 | Yes | No | Yes | Yes | No |

| | | | | | | |
|---|---|---|---|---|---|---|
| Hydrogen | 1333-74-0 | Yes | No | Yes | Yes | No |
| Nitrogen | 7727-37-9 | Yes | No | Yes | Yes | No |

| Inventory (Con't.) | | |
|---|---|---|
| **Component** | **CAS** | **TSCA** |
| Carbon dioxide | 124-38-9 | Yes |
| Hydrogen | 1333-74-0 | Yes |
| Nitrogen | 7727-37-9 | Yes |

## Canada

### Labor

**Canada - WHMIS - Classifications of Substances**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | A, B1 |
| • Carbon dioxide | 124-38-9 | A; Uncontrolled product according to WHMIS classification criteria (solid) |
| • Nitrogen | 7727-37-9 | A |

**Canada - WHMIS - Ingredient Disclosure List**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | 1 % |
| • Nitrogen | 7727-37-9 | Not Listed |

### Environment

**Canada - CEPA - Priority Substances List**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

## China

### Environment

**China - Ozone Depleting Substances - First Schedule**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**China - Ozone Depleting Substances - Second Schedule**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**China - Ozone Depleting Substances - Third Schedule**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

### Other

**China - Annex I & II - Controlled Chemicals Lists**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**China - Dangerous Goods List**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | (compressed or refrigerated liquid) |
| • Carbon dioxide | 124-38-9 | (including solid or refrigerated liquid) |
| • Nitrogen | 7727-37-9 | (compressed or refrigerated liquid) |

**China - Export Control List - Part I Chemicals**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

## Europe

### Other

**EU - CLP (1272/2008) - Annex VI - Table 3.2 - Classification**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | F+; R12 |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**EU - CLP (1272/2008) - Annex VI - Table 3.2 - Concentration Limits**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**EU - CLP (1272/2008) - Annex VI - Table 3.2 - Labelling**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | F+ R:12 S:(2)-9-16-33 |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**EU - CLP (1272/2008) - Annex VI - Table 3.2 - Notes - Substances and Preparations**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**EU - CLP (1272/2008) - Annex VI - Table 3.2 - Safety Phrases**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | S:(2)-9-16-33 |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

## Germany

### Environment

**Germany - TA Luft - Types and Classes**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**Germany - Water Classification (VwVwS) - Annex 1**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | ID Number 741, not considered hazardous to water |
| • Carbon dioxide | 124-38-9 | ID Number 256, not considered hazardous to water |
| • Nitrogen | 7727-37-9 | ID Number 1351, not considered hazardous to |

| | | |
|---|---|---|
| | | water |

**Germany - Water Classification (VwVwS) - Annex 2 - Water Hazard Classes**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**Germany - Water Classification (VwVwS) - Annex 3**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**Other**

**Germany - Specifically Regulated Chemicals in TRGS**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

## Portugal

**Other**

**Portugal - Prohibited Substances**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

## United Kingdom

**Environment**

**United Kingdom - Pollution Inventory - Schedule 1 - Thresholds for Releases to Air**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | 10000000 kg (qualifying renewable fuel sources are reportable when the total amount of CO2 released is above 10 million kg); 10000000 kg |
| • Nitrogen | 7727-37-9 | Not Listed |

**Other**

**United Kingdom - Workplace Exposure Limits (WELs) - Substances in Review**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**United Kingdom - List of Dangerous Substances in Water**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

## United States

**Labor**

**U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |

| | | |
|---|---|---|
| • Nitrogen | 7727-37-9 | Not Listed |

**U.S. - OSHA - Specifically Regulated Chemicals**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

## Environment

**U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**U.S. - CERCLA/SARA - Section 313 - Emission Reporting**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

# United States - California

## Environment

**U.S. - California - Proposition 65 - Carcinogens List**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**U.S. - California - Proposition 65 - Developmental Toxicity**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**U.S. - California - Proposition 65 - Reproductive Toxicity - Female**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**U.S. - California - Proposition 65 - Reproductive Toxicity - Male**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

## United States - Pennsylvania

**Labor**

**U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

**U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances**

| | | |
|---|---|---|
| • Hydrogen | 1333-74-0 | Not Listed |
| • Carbon dioxide | 124-38-9 | Not Listed |
| • Nitrogen | 7727-37-9 | Not Listed |

## 15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

# Section 16 - Other Information

**Relevant Phrases (code & full text)**

- H220 - Extremely flammable gas

  R12 - Extremely flammable.

**Last Revision Date**
- 09/September/2014

**Preparation Date**
- 09/September/2014

**Disclaimer/Statement of Liability**
- To the best of Air Liquide's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this gas mixture is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

**Key to abbreviations**

NDA = No Data Available