SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

Product Identifier

Product Form: Mixture
Product Name: Carbon Dioxide
Synonyms: Dry ice, Carbonic acid gas
CAS No. 124-38-9

Intended Use of the Product
Use of the Substance/Mixture: Industrial use

Name, Address, and Telephone of the Responsible Party

Company
Williams, Inc.
One Williams Center
Tulsa, OK 74172, US
(855) 945-5762 (toll free)
ehs@williams.com

Emergency Telephone Number

Emergency number Chemtrec - 800-424-9300

SECTION 2: HAZARDS IDENTIFICATION

Classification of the Substance or Mixture
Classification (GHS-US)
Simple Asphy
Compressed gas H280

Label Elements

GHS-US Labeling
Hazard Pictograms (GHS-US) : GHS04

Signal Word (GHS-US) : Warning
Hazard Statements (GHS-US) : H280 - Contains gas under pressure; may explode if heated
May displace oxygen and cause rapid suffocation

Precautionary Statements (GHS-US) : P410+P403 - Protect from sunlight. Store in a well-ventilated place

Other Hazards

Other Hazards Not Contributing to the Classification: Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Asphyxiating gas. High concentrations of gas can cause unconsciousness and death due to lack of oxygen. Being under the influence of alcohol may enhance the effects of this product.

Unknown Acute Toxicity (GHS-US) Not available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

<table>
<thead>
<tr>
<th>NAME</th>
<th>PRODUCT IDENTIFIER</th>
<th>% (W/W)</th>
<th>CLASSIFICATION (GHS-US)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide</td>
<td>(CAS No) 124-38-9</td>
<td>97.04 - 97.23</td>
<td>Simple Asphy, Compressed gas, H280</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>(CAS No) 7727-37-9</td>
<td>1.33 - 1.53</td>
<td>Simple Asphy, Compressed gas, H280</td>
</tr>
<tr>
<td>Oxygen</td>
<td>(CAS No) 7782-44-7</td>
<td>0.66 - 0.68</td>
<td>Ox. Gas 1, H270, Compressed gas, H280</td>
</tr>
<tr>
<td>Methane</td>
<td>(CAS No) 74-82-8</td>
<td>0.57 - 0.58</td>
<td>Simple Asphy, Flam. Gas 1, H220 Compressed gas, H280</td>
</tr>
<tr>
<td>Hexane, branched and linear</td>
<td>(CAS No) 92112-69-1</td>
<td>0.11 - 0.12</td>
<td>Flam. Liq. 2, H225, Skin Irrit. 2, H315, STOT SE 3, H336, Asp. Tox. 1, H304, Aquatic Chronic 2, H411</td>
</tr>
</tbody>
</table>

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

Description of First Aid Measures

After Inhalation: When symptoms occur: go into open air and ventilate suspected area. Remove to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms: call a Poison center/doctor/.

Skin Contact: In cases of frostbite from liquefied gas, rinse with plenty of water. Thaw frosted parts with lukewarm water. Do not rub affected area.
**Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if irritation persists.

**Ingestion:** Unlikely route of exposure. Rinse mouth. Do NOT induce vomiting. Get immediate medical attention.

**Most Important Symptoms and Effects Both Acute and Delayed**

- Dizziness
- Coughing
- Frostbite from liquified gas
- Disorientation

**Eye Contact:** This gas is non-irritating; but direct contact with liquefied/pressurized gas or frost particles may produce severe and possibly permanent eye damage from freeze burns.

**SECTION 5: FIREFIGHTING MEASURES**

**NFPA 704 Hazard Class**

- Health: 1
- Flammability: 0
- Instability: 0

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (Minimal)</td>
<td>1 (Slight)</td>
<td>2 (Moderate)</td>
</tr>
<tr>
<td>3 (Serious)</td>
<td>4 (Severe)</td>
<td></td>
</tr>
</tbody>
</table>

**Extinguishing Media**

- **Suitable Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.
- **Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.

**Special Hazards Arising From the Substance or Mixture**

- **Fire Hazard:** Not flammable
- **Explosion Hazard:** Product is not explosive
- **Reactivity:** Hazardous reactions will not occur under normal conditions.

**Advice for Firefighters**

- **Precautionary Measures Fire:** Exercise caution when fighting any chemical fire
- **Firefighting Instructions:** Use water spray or fog for cooling exposed containers. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.
- **Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.
- **Hazardous Combustion Products:** Carbon monoxide, Oxygen.
**Other information:** Do not allow run-off from fire fighting to enter drains or water courses

**Reference to Other Sections**
Refer to section 9 for flammability properties.

### SECTION 6: ACCIDENTAL RELEASE MEASURES

**Personal Precautions, Protective Equipment and Emergency Procedures**

**General Measures:** Avoid breathing (gas, vapor, mist, spray).

**For Non-Emergency Personnel**

- **Protective Equipment:** Use appropriate personal protection equipment (PPE).
- **Emergency Procedures:** Evacuate unnecessary personnel.

**For Emergency Personnel**

- **Protective Equipment:** Equip cleanup crew with proper protection.
- **Emergency Procedures:** Ventilate area.

**Environmental Precautions**

No special measures required.

**Methods and Material for Containment and Cleaning Up**

- **For Containment:** Notify authorities if liquid enters sewers or public waters.
- **Methods for Cleaning Up:** Allow to evaporate/sublime

**Reference to Other Sections**
See heading 8, Exposure Controls and Personal Protection.

### SECTION 7: HANDLING AND STORAGE

**Precautions for Safe Handling**

- **Additional Hazards When Processed:** Do not pressurize, cut, or weld containers. Do not puncture or incinerate container. Liquid gas can cause frost-type burns

- **Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work. Do no eat, drink or smoke when using this product

**Conditions for Safe Storage, Including Any Incompatibilities**

- **Technical Measures:** Forms carbonic acid in water.

- **Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Store in a well-ventilated place. Keep container tightly closed.

- **Incompatible Materials:** Strong oxidizers. Dusts of various metals are ignitable and explosive when suspended in carbon dioxide.
Specific End Use(s): Industrial use

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>OSHA</th>
<th>NIOSH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide (124-38-9)</td>
<td>TWA: 5000 ppm</td>
<td>PEL (TWA): 5000 ppm</td>
<td>REL (TWA): 5000 ppm</td>
</tr>
<tr>
<td></td>
<td>STEL: 30000 ppm</td>
<td>REL (TWA): 9000 mg/m³</td>
<td>REL (STEL): 9000 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PEL (TWA): 9000 mg/m³</td>
<td>REL (STEL): 54000 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>REL (TWA): 5000 ppm</td>
<td>IDLH: 40000 mg/m³</td>
</tr>
<tr>
<td>Methane (74-82-8)</td>
<td>TWA: Minimal oxygen</td>
<td>--</td>
<td>REL (TWA): 800 ppm</td>
</tr>
<tr>
<td></td>
<td>content required</td>
<td></td>
<td>REL (TWA): 1900 mg/m³</td>
</tr>
</tbody>
</table>

Note: State province, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Exposure Controls

General Protective and hygienic measures:
Wash hands before breaks and at the end of work.

Engineering controls: Provide adequate ventilation

Breathing Equipment: Not required under normal conditions of use.

Hand Protection: Wear insulated gloves for protection against thermal hazards.

Eye Protection: Chemical goggles or safety glasses.

Respiratory Protection: Self-contained respiratory protective device should be used in case of large spills or leaks.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on Basic Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear, Colorless gas. Liquefied compressed gas</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
</tbody>
</table>
Odor Threshold : Not available
pH : Not available
Relative Evaporation Rate (butyl acetate=1) : High
Melting Point : -78.5°C (109.3°F)
Freezing Point : Not available
Boiling Point : -78.5°C (174.2°F)
Flash Point : Not available
Auto-ignition Temperature : Not available
Decomposition Temperature : Not available
Flammability (solid, gas) : Not available
Lower Flammable Limit : Not available
Upper Flammable Limit : Not available
Vapor Pressure : 838 psig (5773 kPa) @ 20°C (68°F)
Relative Vapor Density : 1.52 (air = 1) @ 21°C (70°F)
Relative Density : 0.50-0.51 15.6°C (60°F)
Density : 762 kg/m³ Saturated liquid 21.1°C (70°F)
Specific Gravity : 1.50 @15.56°C (60°F), air=1
Solubility : Soluble in water
Log Pow : Not available
Log Kow : Not available
Viscosity, Kinematic : Not available
Viscosity, Dynamic : Not available
Explosion Data – Sensitivity to Mechanical Impact : Not expected to present an explosion hazard due to mechanical impact.
Explosion Data – Sensitivity to Static Discharge : Not expected to present an explosion hazard due to static discharge

SECTION 10: STABILITY AND REACTIVITY


**Reactivity:** Hazardous reactions will not occur under normal conditions.

**Chemical Stability:** Stable at standard temperature and pressure.

**Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.

**Conditions to Avoid:** Extremely high or low temperatures. Incompatible materials like suspended metal dusts.

**Incompatible Materials:** Strong oxidizers

**Hazardous Decomposition Products:** Carbon monoxide, Oxygen.

### SECTION 11: TOXICOLOGICAL INFORMATION

**Information on Toxicological Effects - Product**

**Acute Toxicity:** Not classified

**LD50 and LC50 Data:** Not available

**Skin Corrosion/Irritation:** Not classified

**Serious Eye Damage/Irritation:** Not classified

**Respiratory or Skin Sensitization:** Not classified

**Germ Cell Mutagenicity:** Not classified

**Teratogenicity:** Not available

**Carcinogenicity:** Not classified

**Specific Target Organ Toxicity (Repeated Exposure):** Not classified

**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** Not classified

**Aspiration Hazard:** Not classified

**Symptoms/Injuries after Inhalation:** Gas can be toxic as a simple asphyxiant by displacing oxygen from the air. Asphyxia by lack of oxygen: risk of death. May cause drowsiness or dizziness.

**Symptoms/Injuries after Skin Contact:** Contact with the liquid may cause cold burns/frostbite.

**Symptoms/Injuries after Eye Contact:** This gas is non-irritating; but direct contact with liquefied/pressurized gas or frost particles may produce severe and possibly permanent eye damage from freeze burns.

**Symptoms/Injuries after Ingestion:** Ingestion is not considered a potential route of exposure. Non-irritating; but solid and liquid forms of this material and pressurized gas may cause freeze burns.

### Information on Toxicological Effects - Ingredient(s)

**LD50 and LC50 Data**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>LC50 Inhalation Rat (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CARBON DIOXIDE (124-38-9)</strong></td>
<td>470000 ppm (Exposure time: 30 min)</td>
</tr>
</tbody>
</table>

### SECTION 12: ECOLOGICAL INFORMATION
CARBON DIOXIDE
Safety Data Sheet
according to OSHA HCS (29 CFR 1910.1200) regulations

GHS Classification:
No classified hazards

Toxicity:
No additional information available.

Persistence and Degradability

| CARBON DIOXIDE | Persistence and Degradability | Product is biodegradable. |

Bioaccumulative Potential

| CARBON DIOXIDE | Bioaccumulative Potential | Not expected to bioaccumulate. |

| BUTANE (106-97-8) | Log Pow | 2.89 |

| CARBON DIOXIDE (124-38-9) | BCF fish 1 | (no bioaccumulation) |
| | Log Pow | 0.83 |

Mobility in Soil Not available

Other Adverse Effects
Other adverse effects: Can cause frost damage to vegetation.
Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, provincial, territorial and international regulations.

Additional Information: Empty gas cylinders should be returned to the vendor for recycling or refilling.

SECTION 14: TRANSPORT INFORMATION

UN Number

UN-No.(DOT): 1013
DOT NA no.: UN1013

UN Proper Shipping Name

DOT Proper Shipping Name : UN1013 Carbon dioxide, 2.2

Hazard Labels (DOT) : 2.2 - Non-flammable compressed gas
DOT Packaging Exceptions (49 CFR 173.xxx) : 306
DOT Packaging Non Bulk (49 CFR 173.xxx) : 302; 304
DOT Packaging Bulk (49 CFR 173.xxx) : 302; 314; 315

Additional Information
Emergency Response Guide (ERG) Number : 120

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

Air transport
DOT Quantity Limitations Passenger Aircraft/Rail (49 CFR 173.27) : 75 kg
DOT Quantity Limitations Cargo Aircraft Only (49 CFR 175.75) : 150 kg

SECTION 15: REGULATORY INFORMATION

US Federal Regulations

<table>
<thead>
<tr>
<th>Substance</th>
<th>SARA Section 311/312 Hazard Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butane</td>
<td>Immediate (acute) health hazard</td>
</tr>
<tr>
<td></td>
<td>Sudden release of pressure hazard</td>
</tr>
<tr>
<td>Carbon dioxide (124-38-9)</td>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
<tr>
<td>Nitrogen (7727-37-9)</td>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
<tr>
<td>Oxygen (7782-44-7)</td>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
<tr>
<td>Methane (74-82-8)</td>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
</tbody>
</table>

Canadian Regulations

<table>
<thead>
<tr>
<th>Substance</th>
<th>WHMIS Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARBON DIOXIDE</td>
<td>Class A - Compressed Gas</td>
</tr>
</tbody>
</table>
CARBON DIOXIDE (124-38-9)
Listed on the Canadian DSL (Domestic Substances List) inventory.
WHMIS Classification: Class A - Compressed Gas

NITROGEN (7727-37-9)
Listed on the Canadian DSL (Domestic Substances List) inventory.
Listed on the Canadian Ingredient Disclosure List
WHMIS Classification: Class A - Compressed Gas

OXYGEN (7782-44-7)
Listed on the Canadian DSL (Domestic Substances List) inventory.
Listed on the Canadian Ingredient Disclosure List
WHMIS Classification: Class A - Compressed Gas
Class C - Oxidizing Material

METHANE (74-82-8)
Listed on the Canadian DSL (Domestic Substances List) inventory.
Listed on the Canadian Ingredient Disclosure List
WHMIS Classification: Class A - Compressed Gas
Class B Division 1 - Flammable Gas

HEXANE, BRANCHED AND LINEAR (92112-69-1)
Listed on the Canadian DSL (Domestic Substances List) inventory.
Listed on the Canadian Ingredient Disclosure List
IDL Concentration 1 %
WHMIS Classification: Class B Division 2 - Flammable Liquid
Class D Division 2 Subdivision B - Toxic material causing other toxic effects

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

SECTION 16: OTHER INFORMATION

Revision date : 05/21/2015
Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200
CARBON DIOXIDE
Safety Data Sheet
according to OSHA HCS (29 CFR 1910.1200) regulations

GHS Full Text Phrases:

<table>
<thead>
<tr>
<th>Description</th>
<th>Full Text Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressed gas</td>
<td>Gases under pressure Compressed gas</td>
</tr>
<tr>
<td>Simple Asphy</td>
<td>Simple Asphyxiant</td>
</tr>
<tr>
<td>H280</td>
<td>Contains gas under pressure; may explode if heated</td>
</tr>
</tbody>
</table>

Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

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Party Responsible for the Preparation of This Document

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One Williams Center
Tulsa, OK 74172, US
855-945-5762

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.