



# Carbon Dioxide (DRY ICE)

## Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations  
Revision Date: 02/11/2015 Date of issue: 12/05/2014

Version: 2.0

### SECTION 1: IDENTIFICATION

#### Product Identifier

**Product Form:** Substance

**Product Name:** Carbon Dioxide (DRY ICE)

**Synonyms:** CO<sub>2</sub>

#### Intended Use of the Product

**Use of the Substance/Mixture:** Multiple uses: Industrial, Food & Beverage, Pharmacopeia . For professional use only.

#### Name, Address, and Telephone of the Responsible Party

##### **Company,Manufacturer**

Reliant Gases, LTD  
10817 W County Road 60  
Midland, Texas 79707  
T: 432-617-4200

<http://www.reliantholdingsltd.com>

#### Emergency Telephone Number

**Emergency Number** : (800)523-5566 (Internal)

### SECTION 2: HAZARDS IDENTIFICATION

#### Classification of the Substance or Mixture

**Classification (GHS-US)**

Not classified

#### Label Elements

**GHS-US Labeling** No labeling applicable

#### Other Hazards

Solid carbon dioxide sublimates to give off gaseous CO<sub>2</sub>. Carbon dioxide is the most powerful cerebral vasodilator known. Can result in increased respiration, dizziness, shortness of breath and headache. Exposure to high concentrations for a period of time can result in oxygen deficiency, effects of which may include rapid breathing, diminished mental alertness, impaired muscular coordination, faulty judgment, depression of all sensations, emotional instability, and fatigue. As asphyxiation progresses, nausea, vomiting, prostration, and loss of consciousness may result, eventually leading to convulsions, coma and death.

**Unknown Acute Toxicity (GHS-US)** Not available

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

#### Substances

Name : Carbon Dioxide (DRY ICE)

Name	Product Identifier	% (w/w)	Classification (GHS-US)
Carbon dioxide	(CAS No) 124-38-9	100	Simple Asphy, H380 Compressed gas, H280

### SECTION 4: FIRST AID MEASURES

#### Description of First Aid Measures

**General:** If you feel unwell, seek medical advice (show the label where possible).

**Inhalation:** If inhaled, remove to fresh air and keep at rest in a position comfortable for breathing. Give oxygen or artificial respiration if necessary. If necessary administer pulmonary resuscitation or oxygen, and keep warm. Seek immediate medical advice.

**Skin Contact:** If frostbite or freezing occurs, immediately flush with plenty of lukewarm water to GENTLY warm the affected area. Do not use hot water. Do not rub affected area. Get immediate medical attention.

**Eye Contact:** Immediately rinse with water for a prolonged period (at least 15 minutes) while holding the eyelids wide open. Do not rub. Seek medical attention immediately.

**Ingestion:** Ingestion is an unlikely route of exposure for a gas. If frostbite or freezing occurs, immediately flush with plenty of lukewarm water to GENTLY warm the affected area. Do not use hot water. Do not rub affected area. Get immediate medical attention.

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

**General:** Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

**Inhalation:** Inhalation may affect the nervous system causing headache, possibly dizziness, nausea, weakness, loss of coordination and unconsciousness. Risk of suffocation due to oxygen deficiency in confined areas. In elevated concentrations may cause asphyxiation, central nervous system effects, and increased breathing rate. Symptoms of asphyxiation include headache, dizziness, rapid breathing, increased pulse, mood changes, tremors, cyanosis, muscular weakness, narcosis, numbness of the extremities, unconsciousness and death.

**Skin Contact:** May cause frostbite.

**Eye Contact:** May cause frostbite.

**Ingestion:** Ingestion is likely to be harmful or have adverse effects.

**Chronic Symptoms:** Not available

### **Indication of Any Immediate Medical Attention and Special Treatment Needed**

Symptoms may be delayed. Carefully monitor patients with severe or prolonged exposure for signs of neurological sequelae. If breathing is difficult, give oxygen.

## **SECTION 5: FIRE-FIGHTING MEASURES**

### **Extinguishing Media**

**Suitable Extinguishing Media:** Not flammable. Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media:** None known.

### **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. Do not breathe fumes from fires.

**Protection During Firefighting:** Firefighters should wear full protective gear.

**Hazardous Combustion Products:** Carbon oxides (CO, CO<sub>2</sub>).

### **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:** Evacuate area. Stop leak if safe to do so.

#### **For Non-Emergency Personnel**

**Protective Equipment:** Use recommended respiratory protection.

**Emergency Procedures:** Evacuate unnecessary personnel. Ventilate area. Keep upwind.

#### **For Emergency Personnel**

**Protective Equipment:** If possible, stop flow of product. Use recommended respiratory protection.

**Emergency Procedures:** Evacuate unnecessary personnel. Ventilate area. Keep upwind.

### **Environmental Precautions**

Prevent entry to sewers and public waters. Notify authorities if product enters sewers or public waters.

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

**For Containment:** Ventilate area.

**Methods for Cleaning Up:** Ventilate area. Clean up spills immediately and dispose of waste safely. Take up mechanically (sweeping, shovelling) and collect in suitable container for disposal.

### **Reference to Other Sections**

See heading 8, Exposure Controls and Personal Protection. For further information refer to section 13.

## **SECTION 7: HANDLING AND STORAGE**

### **Precautions for Safe Handling**

**Additional Hazards When Processed:** Avoid contact with skin, eyes and clothing.

**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 when leaving work.

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### Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Ensure all national/local regulations are observed. Provide local exhaust or general room ventilation.

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

**Incompatible Materials:** Powdered metals. Water. strong acids. Strong bases. Strong oxidizers.

**Storage Area:** Store in dry, cool area. Store in a well-ventilated place. Protect from high temperatures.

### Specific End Use(s)

Multiple uses: Industrial, Food & Beverage, Pharmacopeia. For professional use only.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government

Carbon dioxide (124-38-9)		
Mexico	OEL TWA (mg/m <sup>3</sup> )	9000 mg/m <sup>3</sup>
Mexico	OEL TWA (ppm)	5000 ppm
Mexico	OEL STEL (mg/m <sup>3</sup> )	27000 mg/m <sup>3</sup>
Mexico	OEL STEL (ppm)	15000 ppm
USA ACGIH	ACGIH TWA (ppm)	5000 ppm
USA ACGIH	ACGIH STEL (ppm)	30000 ppm
USA OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	9000 mg/m <sup>3</sup>
USA OSHA	OSHA PEL (TWA) (ppm)	5000 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m <sup>3</sup> )	9000 mg/m <sup>3</sup>
USA NIOSH	NIOSH REL (TWA) (ppm)	5000 ppm
USA NIOSH	NIOSH REL (STEL) (mg/m <sup>3</sup> )	54000 mg/m <sup>3</sup>
USA NIOSH	NIOSH REL (STEL) (ppm)	30000 ppm
USA IDLH	US IDLH (ppm)	40000 ppm
Alberta	OEL STEL (mg/m <sup>3</sup> )	54000 mg/m <sup>3</sup>
Alberta	OEL STEL (ppm)	30000 ppm
Alberta	OEL TWA (mg/m <sup>3</sup> )	9000 mg/m <sup>3</sup>
Alberta	OEL TWA (ppm)	5000 ppm
British Columbia	OEL STEL (ppm)	15000 ppm
British Columbia	OEL TWA (ppm)	5000 ppm
Manitoba	OEL STEL (ppm)	30000 ppm
Manitoba	OEL TWA (ppm)	5000 ppm
New Brunswick	OEL STEL (mg/m <sup>3</sup> )	54000 mg/m <sup>3</sup>
New Brunswick	OEL STEL (ppm)	30000 ppm
New Brunswick	OEL TWA (mg/m <sup>3</sup> )	9000 mg/m <sup>3</sup>
New Brunswick	OEL TWA (ppm)	5000 ppm
Newfoundland & Labrador	OEL STEL (ppm)	30000 ppm
Newfoundland & Labrador	OEL TWA (ppm)	5000 ppm
Nova Scotia	OEL STEL (ppm)	30000 ppm
Nova Scotia	OEL TWA (ppm)	5000 ppm
Nunavut	OEL STEL (mg/m <sup>3</sup> )	27000 mg/m <sup>3</sup>
Nunavut	OEL STEL (ppm)	15000 ppm
Nunavut	OEL TWA (mg/m <sup>3</sup> )	9000 mg/m <sup>3</sup>
Nunavut	OEL TWA (ppm)	5000 ppm
Northwest Territories	OEL STEL (mg/m <sup>3</sup> )	27000 mg/m <sup>3</sup>
Northwest Territories	OEL STEL (ppm)	15000 ppm
Northwest Territories	OEL TWA (mg/m <sup>3</sup> )	9000 mg/m <sup>3</sup>
Northwest Territories	OEL TWA (ppm)	5000 ppm

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Ontario	OEL STEL (ppm)	30000 ppm
Ontario	OEL TWA (ppm)	5000 ppm
Prince Edward Island	OEL STEL (ppm)	30000 ppm
Prince Edward Island	OEL TWA (ppm)	5000 ppm
Québec	VECD (mg/m <sup>3</sup> )	54000 mg/m <sup>3</sup>
Québec	VECD (ppm)	30000 ppm
Québec	VEMP (mg/m <sup>3</sup> )	9000 mg/m <sup>3</sup>
Québec	VEMP (ppm)	5000 ppm
Saskatchewan	OEL STEL (ppm)	30000 ppm
Saskatchewan	OEL TWA (ppm)	5000 ppm
Yukon	OEL STEL (mg/m <sup>3</sup> )	27000 mg/m <sup>3</sup>
Yukon	OEL STEL (ppm)	15000 ppm
Yukon	OEL TWA (mg/m <sup>3</sup> )	9000 mg/m <sup>3</sup>
Yukon	OEL TWA (ppm)	5000 ppm

### Exposure Controls

**Appropriate Engineering Controls:** Oxygen detectors should be used when asphyxiating gases may be released. Ensure adequate ventilation, especially in confined areas. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure all national/local regulations are observed.

**Personal Protective Equipment:** Protective goggles. Protective clothing. Insufficient ventilation: wear respiratory protection. Gloves.



**Materials for Protective Clothing:** Chemically resistant materials and fabrics.

**Hand Protection:** Wear chemically resistant protective gloves.

**Eye Protection:** Chemical safety goggles.

**Skin and Body Protection:** Wear suitable protective clothing.

**Respiratory Protection:** A NIOSH-approved self-contained breathing apparatus (SCBA) operated in a pressure demand or other positive pressure mode or equivalent respirator should be used in situations of oxygen deficiency (concentration less than 19.5%), unknown exposure concentrations, conditions that are immediately dangerous to life or health (IDLH), or when exposure levels are above ACGIH or OSHA exposure limits.

**Thermal Hazard Protection:** If material is cold, wear thermally resistant protective gloves.

**Environmental Exposure Controls:** Do not allow the product to be released into the environment.

**Consumer Exposure Controls:** Do not eat, drink or smoke during use

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### Information on Basic Physical and Chemical Properties

Physical State	: Solid
Appearance	: Colorless
Odor	: Odorless to slightly pungent
Odor Threshold	: Not available
pH	: 3.2 - 3.7 (Saturated CO <sub>2</sub> Solution)
Evaporation Rate	: Not available
Melting Point	: -109.3 °F (-78.50 °C)
Freezing Point	: -109.3 °F (-78.50 °C)
Boiling Point	: -109.4 °F (-78.56 °C)
Flash Point	: Not applicable
Critical Temperature	: 87.6 °F (30.89 °C)
Auto-ignition Temperature	: Not available
Decomposition Temperature	: Not available
Flammability (solid, gas)	: Not flammable

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<b>Lower Flammable Limit</b>	: Not applicable
<b>Upper Flammable Limit</b>	: Not applicable
<b>Vapor Pressure</b>	: 838 psig (at 70°F (21.1°C))
<b>Relative Vapor Density</b>	: 1.53 at 78.2 °C
<b>Specific Gravity</b>	: 1.52 (Air = 1) at 70°F (21.1°C)
<b>Solubility</b>	: Water: 0.9 (vol / vol. at 68°F (20°C)) (Appreciable)
<b>Partition Coefficient: N-Octanol/Water</b>	: 0.83
<b>Viscosity</b>	: 14,900 mPa.s at 25 °C
<b>Explosion Data – Sensitivity to Mechanical Impact</b>	: Not expected to present an explosion hazard due to mechanical impact.
<b>Explosion Data – Sensitivity to Static Discharge</b>	: Not expected to present an explosion hazard due to static discharge.
<b>Triple Point</b>	: -69.9 °F (-56.6 °C)
<b>Specific volume</b>	: 8.74 ft <sup>3</sup> /lb (0.5457 m <sup>3</sup> /kg) (at 70 °F (21.1 °C) and 1 atm)
<b>Gas Density</b>	: 0.114 lb/ft <sup>3</sup> (1.832 kg/m <sup>3</sup> ) (at 70 °F (21.1 °C) and 1 atm)
<b>Molecular Weight</b>	: 44.011

## SECTION 10: STABILITY AND REACTIVITY

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

**Chemical Stability:** Stable under recommended handling and storage conditions (see section 7).

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

**Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Ignition sources. Incompatible materials.

**Incompatible Materials:** Dusts of various metals, such as magnesium, zirconium, titanium, aluminum, chromium & manganese are ignitable and explosive when suspended in carbon dioxide. Forms carbonic acid in water.

**Hazardous Decomposition Products:** Decomposes above 2000°C . This produces toxic carbon monoxide.

## 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 classified

**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:** Inhalation may affect the nervous system causing headache, possibly dizziness, nausea, weakness, loss of coordination and unconsciousness. Risk of suffocation due to oxygen deficiency in confined areas. In elevated concentrations may cause asphyxiation, central nervous system effects, and increased breathing rate. Symptoms of asphyxiation include headache, dizziness, rapid breathing, increased pulse, mood changes, tremors, cyanosis, muscular weakness, narcosis, numbness of the extremities, unconsciousness and death.

**Symptoms/Injuries After Skin Contact:** May cause frostbite.

**Symptoms/Injuries After Eye Contact:** May cause frostbite.

**Symptoms/Injuries After Ingestion:** Ingestion is likely to be harmful or have adverse effects.

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

**LD50 and LC50 Data:** Not available

## SECTION 12: ECOLOGICAL INFORMATION

**Toxicity** No additional information available

**Persistence and Degradability** Not available

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### Bioaccumulative Potential

<b>Carbon dioxide (124-38-9)</b>	
<b>BCF Fish 1</b>	(no bioaccumulation)
<b>Log Pow</b>	0.83

**Mobility in Soil** Not available

**Other Adverse Effects** Not available

### SECTION 13: DISPOSAL CONSIDERATIONS

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

**Ecology – Waste Materials:** Avoid release to the environment.

### SECTION 14: TRANSPORT INFORMATION

#### In Accordance with DOT

**Proper Shipping Name** : DRY ICE  
**Identification Number** : UN1845  
**ERG Number** : 120

#### In Accordance with IMDG

**Proper Shipping Name** : CARBON DIOXIDE, SOLID (DRY ICE)  
**Hazard Class** : 9  
**Identification Number** : UN1845  
**Label Codes** : 9  
**EmS-No. (Fire)** : F-C  
**EmS-No. (Spillage)** : S-V



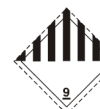
#### In Accordance with IATA

**Proper Shipping Name** : Dry ice  
**Identification Number** : UN1845  
**Hazard Class** : 9  
**Label Codes** : 9  
**ERG Code (IATA)** : 9L



#### In Accordance with TDG

**Proper Shipping Name** : DRY ICE  
**Packing Group** : III  
**Hazard Class** : 9  
**Identification Number** : UN1845  
**Label Codes** : 9



### SECTION 15: REGULATORY INFORMATION

#### US Federal Regulations

<b>Carbon dioxide (124-38-9)</b>
Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### US State Regulations

<b>Carbon dioxide (124-38-9)</b>
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

#### Canadian Regulations

<b>Carbon Dioxide (DRY ICE)</b>	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria
<b>Carbon dioxide (124-38-9)</b>	
Listed on the Canadian DSL (Domestic Substances List)	

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Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification	Class A - Compressed Gas

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, INCLUDING DATE OF PREPARATION OR LAST REVISION

**Revision Date** : 02/11/2015  
**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

#### GHS Full Text Phrases:

Compressed gas	Gases under pressure Compressed gas
Simple Asphy	Simple Asphyxiant
H280	Contains gas under pressure; may explode if heated

#### Party Responsible for the Preparation of This Document

Reliant Gases, LTD  
10817 W County Road 60  
Midland, Texas 79707  
T:(432)617-4200

*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.*

North America GHS US 2012 & WHMIS 2