



**AIR LIQUIDE**

# MATERIAL SAFETY DATA SHEET

*Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards*

## 1. PRODUCT AND COMPANY INFORMATION

**CHEMICAL NAME; CLASS:      CARBON DIOXIDE, SOLID**

**SYNONYMS:** Carbon Anhydride; Carbonic Acid Gas; Carbonic Anhydride; Carbon Dioxide USP; Carbon Dioxide, Refrigerated Liquid; Dry Ice

**CHEMICAL FAMILY NAME:** Acid Anhydride

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

**PRODUCT USE:**

Document Number: 10041

For refrigeration of perishable foods while in transit; as a cooling agent in many industrial processes; as a coolant in vacuum cold traps and laboratories, hospitals and airplanes; to produce theatrical smoke or fog; and, for general analytical/synthetic chemical uses.

**MANUFACTURED/SUPPLIED FOR:**

**ADDRESS:**

**EMERGENCY PHONE:**

**BUSINESS PHONE:**

General MSDS Information 1-713/896-2896

Fax on Demand: 1-800/231-1366



**AIR LIQUIDE**

2700 Post Oak Drive  
Houston, TX 77056-8229

CHEMTREC: 1-800-424-9300

## 2. HAZARD IDENTIFICATION

**EMERGENCY OVERVIEW:** Solid Carbon Dioxide is a colorless to milky white, odorless, very cold solid in the form of snow-like flakes, cubes, blocks, chunks, or nuggets. This solid sublimates to gas quickly at standard temperatures and pressures, forming a fog in air. As a result, the main hazards associated with Carbon Dioxide are related to Carbon Dioxide gas formation and the cold temperature of the solid and evolved gas. Over-exposure to Carbon Dioxide can increase respiration and heart rate, possibly resulting in circulatory insufficiency, which may lead to coma and death. At concentrations between 2 and 10%, Carbon Dioxide can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. Exposure to Carbon Dioxide can also cause asphyxiation, through displacement of oxygen. If the gas concentration reaches 10% or more, suffocation can occur within minutes. Contact with the cold solid or cold gas evolved from sublimation may cause immediate freezing of exposed tissue. Moisture in the air could lead to the formation of carbonic acid from Carbon Dioxide gas, which can be irritating to the eyes. All forms of Carbon Dioxide are non-combustible.

**SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE:** The most significant routes of over-exposure for Carbon Dioxide are by inhalation of Carbon Dioxide gas, and skin or eye contact with the solid or gas. Symptoms of such exposure are as follows:

**INHALATION:** Gaseous Carbon Dioxide is an asphyxiant and a powerful cerebral vasodilator. If the concentration of Carbon Dioxide reaches 10% or more, suffocation can occur within minutes. At concentrations between 2 and 10%, Carbon Dioxide can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. Carbon Dioxide initially stimulates respiration and then causes respiratory depression. High concentrations result in narcosis. Repeated inhalation of low concentrations (3-5%) have no known permanent harmful effects. Symptoms in humans are as follows:

<b><u>CONCENTRATION</u></b>	<b><u>EFFECT</u></b>
1%	Slight increase in breathing rate.
2%	Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness.
3%	Breathing increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increase in blood pressure and pulse rate.
4-5%	Breathing increases to approximately four times normal rate, symptoms of intoxication become evident and slight choking may be felt.
5-10%	Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness.
50-100%	Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation.

High concentrations of this gas can also cause an oxygen-deficient environment. However, the asphyxiating properties of Carbon Dioxide will be reached before oxygen-deficiency is a factor.

**CONTACT WITH SKIN or EYES:** Contact with solid Carbon Dioxide can cause frostbite to skin, eyes, and other exposed tissue. Contact of the cold gas generated from the solid with the skin can lead to frostbite or dermatitis (red, cracked, irritated skin), depending upon concentration and duration of exposure. Contact of the cold gas with the eyes can cause pain, redness, burns, and severe exposure could cause blindness.

**OTHER POTENTIAL HEALTH EFFECTS:** Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with cold gas or solid can quickly subside. Moisture in the air could lead to the formation of carbonic acid, which can be irritating to the eyes.

## 2. HAZARD IDENTIFICATION (Continued)

**HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms.** Over-exposure to solid Carbon Dioxide and the gas formed by sublimation may cause the following health effects:

**ACUTE:** Contact with solid Carbon Dioxide or cold gas can cause frostbite to skin, eyes, and other exposed tissue. Carbon Dioxide gas evolved from the sublimation of the solid is an asphyxiant and a powerful cerebral vasodilator. Inhaling large quantities causes rapid circulatory insufficiency, which can lead to coma or death. At low concentrations, inhalation of Carbon Dioxide can cause nausea, dizziness, visual disturbances, shaking, headache, mental confusion, sweating, increased heartbeat, and elevated blood pressure and respiratory rate. High concentrations of the in air may cause eye irritation. Contact of the evolved gas with the eyes can cause damage to the retinal ganglion cells.

**CHRONIC:** There are currently no known adverse health effects associated with chronic exposure to solid Carbon Dioxide or the gas which is generated by sublimation.

**TARGET ORGANS:** Respiratory system, central nervous system, eyes.

## 3. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			OTHER ppm
			TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	
Carbon Dioxide	124-38-9	> 99.5%	5000	30,000	5000 10,000 (Vacated 1989 PEL)	30,000 (Vacated 1989 PEL)	40,000	DFG-MAK: 5000 NIOSH REL TWA: 5000 C: 30000 ppm
Maximum Impurities		< 0.5%	None of the trace impurities in Carbon Dioxide contribute significantly to the hazards associated with the product. All hazard information pertinent to Carbon Dioxide has been provided in this Material Safety Data Sheet, per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200) and State equivalents standards.					

**This material is classified as hazardous under OSHA regulations in the United States and the WHMIS in Canada.**

NE = Not Established

C = Ceiling Limit

See Section 16 for Definitions of Terms Used.

NOTE: all WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-2004 format.

## 4. FIRST-AID MEASURES

**RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO SOLID OR GASEOUS CARBON DIOXIDE WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus equipment should be worn.**

**SKIN EXPOSURE:** Remove any clothing that may restrict circulation to any frozen area. Do not rub frozen parts as tissue damage may occur. As soon as practicable, place any affected area in warm water bath which has a temperature that does not exceed 105°F (40°C). NEVER USE HOT WATER. NEVER USE DRY HEAT. If area of frostbite is extensive, remove clothing while showering with warm water. If warm water is not available, or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area of the body in the armpit. Encourage victim to gently exercise the affected part while being warmed. Seek immediate medical attention.

Frozen tissue is painless and appears waxy, with a possible yellow color. Frozen tissue will become swollen, painful and prone to infection when thawed. If the frozen part of the body has been thawed by the time medical attention has been obtained, cover the area with a dry sterile dressing and a large bulky protective covering.

**INHALATION:** Remove victim(s) to fresh air, as quickly as possible. Trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary.

**EYE EXPOSURE:** If irritation of the eye develops after exposure to solid or gas, open victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Seek medical assistance immediately, preferably an ophthalmologist.

Victim(s) must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s).

## 5. FIRE-FIGHTING MEASURES

**FLASH POINT:** Not applicable.

**AUTOIGNITION TEMPERATURE:** Not applicable.

**FLAMMABLE LIMITS (in air by volume, %):**

Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

**FIRE EXTINGUISHING MATERIALS:** Carbon Dioxide gas is commonly used as an extinguishing agent for Class B and Class C fires. Use extinguishing media appropriate for the surrounding fire.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** Solid Carbon Dioxide will sublime into gas rapidly when exposed to air and normal temperatures, forming an oxygen-deficient vapor cloud. Additionally, if large concentrations of Carbon Dioxide gas are present, the water vapor in the surrounding air will condense, creating a dense fog. Evacuate the surrounding area; visibility may be obscured in such a vapor cloud making it difficult to find fire exits or equipment. Contact with solid Carbon Dioxide or the cold gas may cause frostbite.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

**SPECIAL FIRE-FIGHTING PROCEDURES:** Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment.

## 6. ACCIDENTAL RELEASE MEASURES

**LEAK RESPONSE:** Evacuate immediate area. Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a leak, clear the affected area, protect people, and respond with trained personnel.

Minimum Personal Protective Equipment should be **Level B: protective clothing, leather or thermally insulating gloves and Self-Contained Breathing Apparatus.** Locate and seal the source of the release. Pick-up and immediately place solid pieces of dry ice in an appropriate, thermally-insulated, vented container. Alternatively, allow the solid to sublime and the gas which is generated to dissipate. Monitor the surrounding area for Carbon Dioxide and oxygen levels. The level of Carbon Dioxide must be below 3%, and the atmosphere must have at least 19.5 percent oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus.

## 7. HANDLING AND STORAGE

**WORK PRACTICES AND HYGIENE PRACTICES:** Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of Carbon Dioxide could occur without any significant warning symptoms.

**STORAGE AND HANDLING PRACTICES:** Do not handle solid Carbon Dioxide with bare hands. Use heavy gloves or dry ice tongs. Handle blocks of dry ice carefully, as injuries can occur if one is accidentally dropped on the feet. Never store dry ice in a standard refrigerator, cooler, or freezer designed for food storage.

Containers of solid Carbon Dioxide should be stored upright and be firmly secured to prevent falling or being knocked-over. Containers should be vented, to prevent the build-up of Carbon Dioxide gas.

Containers should be stored in dry, well-ventilated areas away from sources of heat, ignition and direct sunlight. Carbon Dioxide sublimates at -109.3°F (-78.5°C); containers should be thermally insulated and kept at the lowest possible temperature to maintain the solid and avoid generation of Carbon Dioxide gas. Store containers away from heavily trafficked areas and emergency exits. Store containers away from process and production areas, away from elevators, building and room exits or main aisles leading to exits. Protect containers against physical damage. Isolate from other non-compatible chemicals (refer to Section 10, Stability and Reactivity).

Storage containers and equipment should not be located in sub-surface or enclosed areas, unless engineered to maintain a concentration of Carbon Dioxide below the TLV (TLV = 5000 ppm) in the event of a release.

**PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT:** Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely, if necessary.

## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

**VENTILATION AND ENGINEERING CONTROLS:** Use with adequate ventilation. Carbon Dioxide gas evolved from sublimation of the solid accumulates in low-lying areas with limited air movement. Natural or mechanical ventilation should be available in the worker's breathing zone to prevent levels of Carbon Dioxide above exposure limits. Local exhaust ventilation is preferred, because it prevents dispersion of this gas into the work place by eliminating it at its source. Areas of solid Carbon Dioxide use should be engineered to remove vapor from the lowest possible level and exhaust vapor to a well-ventilated area or to the outside. Carbon Dioxide levels should be monitored to assure levels are maintained below the TLV. If appropriate, install automatic monitoring equipment to detect the levels of Carbon Dioxide and of oxygen.

**RESPIRATORY PROTECTION:** Maintain Carbon Dioxide levels below those listed in Section 2 (Composition and Information on Ingredients) and oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection if Carbon Dioxide levels are above the IDLH (40,000 ppm) or during emergency response to a release of Carbon Dioxide. If respiratory protection is required, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent State standards. Respiratory selection guidelines from NIOSH for Carbon Dioxide are provided below for information.

**CONCENTRATION**

UP TO 40,000 ppm:

**RESPIRATORY EQUIPMENT**

Supplied Air Respirator (SAR); or full-facepiece Self-Contained Breathing Apparatus (SCBA).

**EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS:** Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.

**ESCAPE:** Escape-type SCBA.

**NOTE:** The IDLH concentration for Carbon Dioxide is 40,000 ppm.

**EYE PROTECTION:** Safety glasses.

**HAND PROTECTION:** Wear thermally insulated gloves.

**BODY PROTECTION:** Use body protection appropriate for task. Safety shoes are recommended when handling large, solid Carbon Dioxide containers or block of dry ice.

## 9. PHYSICAL and CHEMICAL PROPERTIES

**GAS DENSITY @ 21.1°C (70°F) and 1 atm:** 0.1144 lb/ft<sup>3</sup> (1.833 kg/m<sup>3</sup>)

**BOILING POINT:** -78.5°C (-109.3°F)

**LIQUID DENSITY @ 70°F (21.1°C) and 838 psig (5778 kPa):** 0.114 lb/ft<sup>3</sup> (1.833 kg/m<sup>3</sup>)

**FREEZING/MELTING POINT:** (sublimation temperature) 78.5°C (-109.3°F)

**SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C):** 1.522      **pH:** 3.7 at 1 atm (form carbonic acid)

**EXPANSION RATIO 21.1°C (70°F):** Not applicable.

**EVAPORATION RATE (nBuAc = 1):** Not applicable.

**ODOR THRESHOLD:** Odorless.

**MOLECULAR WEIGHT:** 44.01

**TRIPLE POINT:** -55.6 °C (-69.9°F) @ 60.4 psig (416 kPa)      **SPECIFIC VOLUME (ft<sup>3</sup>/lb):** 8.76

**SOLUBILITY IN WATER vol/vol 20°C (68°F) and 1 atm:** 0.90

**VAPOR PRESSURE @ 21.1°C (70°F) (psig):** 838 psig (5778 kPa)

**COEFFICIENT WATER/OIL DISTRIBUTION:** Not applicable.

**APPEARANCE AND COLOR:** Solid Carbon Dioxide is a colorless to milky white, odorless, very cold solid in the form of snow-like flakes, cubes, blocks, chunks, or nuggets. This solid sublimates to gas quickly at standard temperatures and pressures, forming a fog in air. As the gas is slightly acidic, some individuals may notice a slightly pungent odor and biting taste.

**HOW TO DETECT THIS SUBSTANCE (warning properties):** The appearance of the solid is a characteristic property of Carbon Dioxide.

## 10. STABILITY and REACTIVITY

**STABILITY:** Normally stable.

**DECOMPOSITION PRODUCTS:** Carbon Dioxide will produce Carbon Monoxide and Oxygen when heated to temperatures above 3000°F (1648°C).

**MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:** Carbon Dioxide will ignite and explode when heated with powdered aluminum, beryllium, cerium alloys, chromium, magnesium-aluminum alloys, manganese, thorium, titanium, and zirconium. In the presence of moisture, Carbon Dioxide will ignite with cesium oxide. Metal acetylides will also ignite and explode on contact with Carbon Dioxide. Carbon Dioxide will react with alkaline materials to form carbonates and bicarbonates.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** Avoid exposing containers of solid Carbon Dioxide to elevated temperatures, which could cause rapid loss of product.

## 11. TOXICOLOGICAL INFORMATION

**TOXICITY DATA:** The Carbon Dioxide gas generated from the sublimation of the solid is an asphyxiant gas, which has physiological effects at high concentrations. Inhalation of high concentrations of the gas can also result in narcosis. The following toxicological information is available for Carbon Dioxide.

LCLo (inhalation, human) = 9 pph/5 minutes.

LCLo (inhalation, mammal) = 90000 ppm/5 minutes.

TCLo (inhalation, rat) = 6 pph/24 hours; reproductive and teratogenic effects.

**SUSPECTED CANCER AGENT:** Carbon Dioxide is not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, IARC, and therefore is not considered to be, nor suspected to be a cancer-causing agent by these agencies.

**IRRITANCY OF PRODUCT:** Contact with the solid or cold, rapidly expanding gas evolved from the solid can cause frostbite and damage to exposed skin and eyes.

**SENSITIZATION OF PRODUCT:** Carbon Dioxide is not a sensitizer.

**REPRODUCTIVE TOXICITY INFORMATION:** Listed below is information concerning the effects of Carbon Dioxide on the human reproductive system.

Mutagenicity: Carbon Dioxide is not expected to cause mutagenic effects in humans.

Embryotoxicity: Carbon Dioxide has not been reported to cause embryotoxic effects; see following paragraph for further information.

Teratogenicity: Carbon Dioxide is not expected to cause teratogenic effects in humans. Clinical studies involving test animals exposed to high concentrations of Carbon Dioxide indicate teratogenic effects.

Reproductive Toxicity: Carbon Dioxide is not expected to cause adverse reproductive effects in humans. Clinical studies involving test animals exposed to high concentrations of Carbon Dioxide indicate reproductive effects.

*A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.*

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Pre-existing respiratory conditions may be aggravated by over-exposure to Carbon Dioxide.

**RECOMMENDATIONS TO PHYSICIANS:** Treat symptoms and reduce over-exposure.

**BIOLOGICAL EXPOSURE INDICES (BEIs):** Currently, Biological Exposure Indices (BEIs) are not applicable for Carbon Dioxide.

## 12. ECOLOGICAL INFORMATION

**ENVIRONMENTAL STABILITY:** Solid Carbon Dioxide sublimates quickly at standard temperatures and pressures. Carbon Dioxide gas occurs naturally in the atmosphere. The gas will be dissipated rapidly in well-ventilated areas.

**EFFECT OF MATERIAL ON PLANTS or ANIMALS:** No adverse effect is anticipated to occur to animal or plant-life, except for frost or frostbite produced in the presence of solid Carbon Dioxide or the gas evolved after sublimation.

**EFFECT OF CHEMICAL ON AQUATIC LIFE:** No evidence is currently available on Carbon Dioxide's effects on aquatic life. Large releases of solid Carbon Dioxide in the may be harmful to aquatic life, by lowering the pH of a contaminated body of water.

## 13. DISPOSAL CONSIDERATIONS

**PREPARING WASTES FOR DISPOSAL:** Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Return Air Liquide containers to Air Liquide. Do not dispose of locally.

For emergency disposal, secure the container, allow the solid to sublime and the evolved gas to dissipate in a well-ventilated area or outdoors.

## 14. TRANSPORTATION INFORMATION

**THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.**

**PROPER SHIPPING NAME:** Carbon dioxide, solid *or* Dry ice  
**HAZARD CLASS NUMBER and DESCRIPTION:** 9 (Miscellaneous Dangerous Goods)  
**UN IDENTIFICATION NUMBER:** UN 1845  
**PACKING GROUP:** III  
**DOT LABEL(S) REQUIRED:** None  
**NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996):** 120

**MARINE POLLUTANT:** Carbon Dioxide is not classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B).

**SPECIAL SHIPPING INFORMATION:** Containers should be transported in a secure position, in a well-ventilated vehicle. The transportation of Solid Carbon Dioxide storage containers in automobiles or in closed-body vehicles present serious safety hazards and should be discouraged.

**TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:** THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Use the above information for the preparation of Canadian Shipments.

## 15. REGULATORY INFORMATION

**SARA REPORTING REQUIREMENTS:** Carbon Dioxide is not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act.

**SARA THRESHOLD PLANNING QUANTITY:** Not applicable.

**TSCA INVENTORY STATUS:** Carbon Dioxide is listed on the TSCA Inventory.

**CERCLA REPORTABLE QUANTITY (RQ):** Not applicable.

### OTHER U.S. FEDERAL REGULATIONS:

- Carbon Dioxide USP is regulated by the FDA as a prescription drug.
- Carbon Dioxide is subject to the reporting requirements of CFR 29 1910.1000. Carbon Dioxide is listed on Table Z.1.
- Depending on specific operations involving the use of Carbon Dioxide, the regulations of the Process Safety Management of Highly Hazardous Chemicals may be applicable (29 CFR 1910.119). Under this regulation Carbon Dioxide is not listed in Appendix A.
- Carbon Dioxide does not contain any Class I or Class II ozone depleting chemicals (40 CFR part 82).
- Carbon Dioxide is not listed as a Regulated Substance, per 40 CFR, Part 68, of the Risk Management for Chemical.

## 15. REGULATORY INFORMATION (Continued)

**CALIFORNIA PROPOSITION 65:** Carbon Dioxide is not on the California Proposition 65 lists.

**STATE REGULATORY INFORMATION:** Carbon Dioxide is covered under the following specific State regulations:

**Alaska - Designated Toxic and Hazardous Substances:** Carbon Dioxide.

**California - Permissible Exposure Limits for Chemical Contaminants:** Carbon Dioxide.

**Florida - Substance List:** Carbon Dioxide.

**Illinois - Toxic Substance List:** Carbon Dioxide.

**Kansas - Section 302/313 List:** No.

**Massachusetts - Substance List:** Carbon Dioxide.

**Michigan - Critical Materials List:** No.

**Minnesota - List of Hazardous Substances:** Carbon Dioxide.

**Missouri - Employer Information/Toxic Substance List:** Carbon Dioxide.

**New Jersey - Right to Know Hazardous Substance List:** Carbon Dioxide.

**North Dakota - List of Hazardous Chemicals, Reportable Quantities:** No.

**Pennsylvania - Hazardous Substance List:** Carbon Dioxide.

**Rhode Island - Hazardous Substance List:** Carbon Dioxide.

**Texas - Hazardous Substance List:** No.

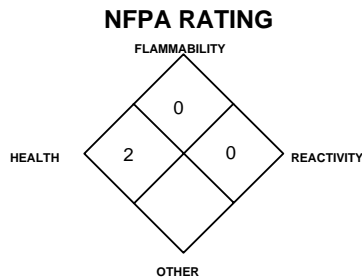
**West Virginia - Hazardous Substance List:** Carbon Dioxide.

**Wisconsin - Toxic and Hazardous Substances:** Carbon Dioxide.



**OTHER CANADIAN REGULATIONS:** There is insufficient information for the classification of Carbon Dioxide, solid. Carbon Dioxide, gas is categorized as a Controlled Product, Hazard Class A as per the Controlled Product Regulations.

## 16. OTHER INFORMATION

### SOLID CARBON DIOXIDE



### SOLID CARBON DIOXIDE

HAZARDOUS MATERIAL INFORMATION SYSTEM			
<b>HEALTH</b>	(BLUE)	2	
<b>FLAMMABILITY</b>	(RED)	0	
<b>REACTIVITY</b>	(YELLOW)	0	
<b>PROTECTIVE EQUIPMENT</b>		X	
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For routine industrial applications			

Further information about Carbon Dioxide and Dry Ice can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 4221 Walney Road 5<sup>th</sup> floor, Chantilly, VA 20151-2923. Telephone: (703) 788-2700.

G-6	"Carbon Dioxide"
G-6.1	"Standard for Low Pressure Carbon Dioxide Systems at Customer Sites"
G-6.2	"Commodity Specification for Carbon Dioxide"
G-6.3	"Carbon Dioxide Cylinder Filling and Handling Procedures"
G-6.5	"Standard for Small Stationary Carbon Dioxide Systems"
G-6.6	"Standard for Elastomer-Type Bulk Transfer Hose"
P-1	"Safe Handling of Compressed Gases in Containers"
P-7	"Standard for the Re-Qualification of Cargo Tank Hose"
P-14	"Accident Prevention in Oxygen-Rich and Oxygen Deficient Atmospheres"
SB-2	"Oxygen Deficient Atmospheres"
AV-1	"Safe Handling and Storage of Compressed Gases"
AV-7	"Characteristics and Safe Handling of Carbon Dioxide"



## 16. OTHER INFORMATION (Continued)

**PREPARED BY:**

CHEMICAL SAFETY ASSOCIATES, Inc.  
9163 Chesapeake Drive, San Diego, CA 92123-1002  
619/565-0302

Fax on Demand: 1-800/231-1366



This Material 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 Carbon Dioxide. 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 Carbon Dioxide 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.