

Material Safety Data Sheet

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MSDS # 1118
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Supersedes
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SECTION I - PRODUCT IDENTIFICATION

Trade Name(s): Carbon Dioxide, Refrigerated Liquid

Synonyms: Carbonic Acid; Carbonic Anhydride; CO₂; Liquefied CO₂

Product Class: Carbon Dioxide

Product Appearance & Odor: Colorless gas, no odor.

DOT Hazard Shipping Description: UN2187 Carbon Dioxide, refrigerated liquid 2.2 II

Label Required: CARBON DIOXIDE, REFRIGERATED LIQUID

QT



NFPA Hazard Classification: Health (Blue) = 3
Flammability (Red) = 0
Reactivity (Yellow) = 0

SECTION II - HAZARDOUS INGREDIENTS

| Ingredients: | CAS# | % (Range) | Occupational Exposure Limits | |
|---------------------|-------------|------------------|-------------------------------------|---------------------|
| | | | ACGIH TLV-TWA | OSHA PEL-TWA |
| Carbon Dioxide | 124-38-9 | 99.9 | 5,000 ppm 30,000 ppm (STEL) | 5,000 ppm |

Ingredients, other than those mentioned above, as used in this product are not hazardous as defined under current Department of Labor regulations, or are present in de minimus concentrations (less than 0.1% for carcinogens, less than 1.0% for other hazardous materials).

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SECTION III - PHYSICAL DATA

Sublimation Point: -78°C (-109°F) @ 1 atm

Vapor Density: 1.522 (air = 1)

Percent Volatile by Volume: 100%

Vapor Pressure: 60 atm (881.4 psia) @ 22.4°C (72.3°F)

Specific Gravity: 1.02 g/cc (8.5 lb/gal)

Solubility in Water: 0.14 g/100 g @ 0°C (32°F)

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not flammable

Extinguishing Media: Not applicable

Special Fire Fighting Procedures: Not applicable.

Unusual Fire and Explosion Hazards: Not applicable.

Flammable Limits: Not Flammable

SECTION V - HEALTH HAZARD DATA

Carcinogenicity:

NTP: No

IARC Monographs: No

OSHA Regulated: No

Effects of Overexposure

Eyes: Contact with solid or gas from rapidly evaporating liquid can cause frostbite and freeze burns.

Skin: Contact with solid or gas from rapidly evaporating liquid can cause frostbite and freeze burns.

Ingestion: Not considered a likely scenario.

Inhalation: 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. Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

Systemic or Other Effects: Agents such as CO₂, which can induce hypoxia at high concentrations, have been shown to produce teratogenic effects in laboratory animals. May aggravate pre-existing pulmonary conditions.

Emergency and First Aid Procedures

Eyes: In cases of freezing or cryogenic "burns" by rapidly evaporating liquid, remove the victim from the source of contamination and open eyelids wide to allow liquid/solid to evaporate/sublime. DO NOT WASH THE EYES WITH HOT OR EVEN TEPID WATER! If the victim cannot tolerate light, protect eyes from light with a bandage or handkerchief. Seek immediate medical attention, preferably from an Ophthalmologist.

Skin: Immediately flush the affected area with lukewarm, not hot, water. If a freeze burn has occurred, get medical attention.

Ingestion: Not considered a likely scenario.

Inhalation: Immediately remove to fresh air. Unconscious persons should be given supplemental oxygen. If breathing has stopped, apply artificial respiration. Keep warm and at rest. Get immediate medical attention for all cases of overexposure. Note: Carbon Dioxide has no warning properties!

Special Considerations: None.

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SECTION VI - REACTIVITY DATA

Stability: Stable.

Conditions to Avoid: Protect vessel from source of heat that could lead to increased pressure.

Materials to Avoid (Incompatibility): Reactive metals such as potassium, sodium and magnesium. Other incompatible materials are acrylaldehyde, aziridine, cesium oxide, metal acetylides, and peroxides.

Hazardous Decomposition Products: Carbon Monoxide may be formed at temperatures above 1,700°C (3,092 °F).

Hazardous Polymerization: Will not occur.

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be taken in Case Material is Released or Spilled: Keep spill response perimeter back to point of 19% (or more) oxygen. Wear self-contained breathing apparatus for any emergency situation requiring work in spill area. Follow applicable Federal, State and local reporting requirements.

Waste Disposal Method: Liquid Carbon Dioxide will evaporate over time and will not leave residue; no chemical clean up will be necessary. Vegetation, insects, reptiles, fish and small mammals contacted by liquid Carbon Dioxide and/or the vapor cloud may be injured or killed. Further environmental restoration measures may be required.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Ventilation: Provide adequate general and local exhaust ventilation to attain occupational exposure limits and to prevent the formation of an oxygen deficient atmosphere, particularly in a confined space area.

Respiratory Protection: Wearing of SCBA is required if containing large spills or upon entry into large tanks, vessels, and other designated confined space areas. Situations where airborne concentrations may exceed occupational exposure limits require proper ventilation.

Protective Clothing: CO₂ is extremely cold (-109°F, -78°C), contact with solid and/or gas may cause tissue damage. Wearing of appropriate protective clothing and gloves that provide some insulating ability is suggested to prevent contact with this chemical.

Eye Protection: CO₂ is extremely cold (-109°F, -78°C), contact with solid and/or gas may cause tissue damage. Remove contact lenses and wear safety glasses, chemical goggles or face shield when handling this chemical.

Other Precautions Required: None.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling and storage: Store in compliance with all Federal, State, and local regulations. The high vapor pressure of liquid Carbon Dioxide is the main concern in storage. Protect vessel from puncture and store away from sources of heat that will cause the pressure to increase

Other Precautions: None.

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SECTION X - SPECIAL INFORMATION

EPCRA Section 311/312 Hazard Categorization:

| Acute | Chronic | Fire | Pressure | Reactive |
|-------|---------|------|----------|----------|
| X | | | X | |

EPCRA & CAA Hazardous Substance Reporting Requirements:

| Ingredient | CAS No. | % by wt. | CAA 112(r) | 302 TPQ lb. | 304 RQ lb. | 313 TRI |
|-------------|---------|----------|------------|-------------|------------|---------|
| none listed | | | | | | |

Key: CAA 112(r) = Toxic Substance with potential for airborne release
Sec. 302 TPQ = Extremely Hazardous Substances (EHS) Threshold Planning Quantity
Sec. 304 RQ = EHS and CERCLA Reportable Quantity if spilled
Sec. 313 TRI = Toxic Chemicals to be reported on Toxic Release Inventory if spilled

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