



Carbon Dioxide, Solid or Dry Ice

Safety Data Sheet P-4575

Making our planet more productiveSM according to U.S. Code of Federal Regulations 29 CFR 1910.1200. Hazard Communication. Date of Issue: 01/01/1997 Revision date: 01/12/2015 Supersedes: 05/01/2009



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SECTION 1: Product and company identification

1.1. Product identifier	: Substance
Product form	: Carbon Dioxide, Solid or Dry Ice
Name	: 124-38-9
CAS No	: CO2
Formula	: Dry Ice (suggests, pellets, or blocks), carbonic, carbonic anhydride
Other means of identification	: Industrial use. Use as directed.
1.2. Relevant identified uses of the substance or mixture and uses advised against	
Use of the substance/mixture	: Industrial use. Use as directed.
1.3. Details of the supplier of the safety data sheet	
Praxair, Inc.	
39 Old Ridgebury Road	
Danbury, CT 06810-5113 - USA	
T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146	
www.praxair.com	
1.4. Emergency telephone number	: Onsite Emergency: 1-800-645-4633
Emergency number	: CHEMTREC, 24hr/day 7days/week — Within USA: 1-800-424-9300. Outside USA: 001-703-527-3887 (collect calls accepted, Contract 17729)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture	
Classification (GHS-US)	Not classified

2.2. Label elements

GHS-US labeling	
Hazard pictograms (GHS-US)	
Signal word (GHS-US)	: None
Hazard statements (GHS-US)	: Danger : CGA-HG01 - MAY CAUSE FROSTBITE : MAY CAUSE CRYOGENIC BURNS OR INJURY : CGA-HG03 -MAY INCREASE RESPIRATION AND HEART RATE. : VAPOR MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION

2.3. Other hazards

Other hazards not contributing to the classification	: Refrigerated solidified gas. CONTACT WITH PRODUCT MAY CAUSE COLD BURNS OR FROSTBITE.
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2.4. Unknown acute toxicity (GHS-US)

Other hazards not contributing to the classification	: Dry ice sublimates to carbon dioxide vapor at -109°F (-78°C). VAPOR MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.
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SECTION 3: Composition/information on ingredients

3.1. Substance	
EN (English US)	: No data available
	: SDS ID: P-4575

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SECTION 4: First aid measures

4.1. Description of first aid measures	
First-aid measures after inhalation	: Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
First-aid measures after skin contact	: In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
First-aid measures after eye contact	: Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Get immediate medical attention.
First-aid measures after ingestion	: Ingestion is not considered a potential route of exposure.
4.2. Most important symptoms and effects, both acute and delayed	
First-aid measures after ingestion	: No additional information available
4.3. Indication of any immediate medical attention and special treatment needed	
None.	

SECTION 5: Firefighting measures

5.1. Extinguishing media	
Extinguishing media	: No additional information available
5.2. Special hazards arising from the substance or mixture	
Reactivity	: None.
5.3. Advice for firefighters	
Firefighting instructions	: Evacuate all personnel from danger area. Do not discharge sprays onto solid carbon dioxide. Solid carbon dioxide will freeze water rapidly. NEVER HANDLE SOLID CARBON DIOXIDE WITH YOUR BARE HANDS. USE GLOVES OR DRY ICE TONGS OR A DRY SHOVEL OR SCOOP. Move packages away from fire area if safe to do so. Self-contained breathing apparatus may be required by rescue workers. Containers must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures	
General measures	: Use protective clothing. Wear cold-insulating gloves/face shield/eye protection. Chemical asphyxiant. Exposure to low concentrations for extended periods may result in dizziness or unconsciousness, and may lead to death. Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. NEVER HANDLE SOLID CARBON DIOXIDE WITH YOUR BARE HANDS. USE GLOVES OR DRY ICE TONGS OR A DRY SHOVEL OR SCOOP.
6.1.1. For non-emergency personnel	: No additional information available
6.1.2. For emergency responders	: No additional information available
6.2. Environmental precautions	
Environmental precautions	: Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.
6.3. Methods and material for containment and cleaning up	
Methods and material for containment and cleaning up	: No additional information available

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6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling

- Avoid materials incompatible with cryogenic use; some metals such as carbon steel may fracture easily at low temperature. Vapor can cause rapid suffocation due to oxygen deficiency. Never allow any unprotected part of your body to touch solid carbon dioxide or to touch uninsulated pipes or vessels containing solid or liquid carbon dioxide or cold carbon dioxide gas. Not only can you suffer frostbite, your skin may stick fast to the cold surfaces. Use brags or insulated gloves when handling solid carbon dioxide or objects in contact cold carbon dioxide in any form. Wear protective clothing and equipment as prescribed in section 8. For other precautions in using carbon dioxide, see section 16.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions

- Store and use with adequate ventilation. Do not store in tight containers or confined spaces. Storage areas should be clean and dry. Solid carbon dioxide is generally delivered to customers in 50-lb (22.7-Kg), 1/2-cubic ft (0.0142 cubic meter) blocks (approximate dimensions), wrapped in kraft paper. Small pellets or nuggets are also produced. The product should be stored in insulated containers open from the top. Lids should fit loosely so that carbon dioxide gas is about 1 1/2 times as heavy as air and will accumulate in low-lying areas, so ventilation must be adequate at floor or below grade level.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Carbon Dioxide, Solid or Dry Ice (124-38-9)	
ACGIH TLV-TWA (ppm)	5000 ppm
ACGIH TLV-STEL (ppm)	30000 ppm
USA OSHA OSHA PEL (TWA) (mg/m ³)	9000 mg/m ³
USA OSHA OSHA PEL (TWA) (ppm)	5000 ppm

8.2. Exposure controls

Appropriate engineering controls

- Oxygen detectors should be used when asphyxiating gases may be released. Ensure exposure is regularly checked for leaks. Provide adequate general and local exhaust ventilation. Consider work permit system e.g. for maintenance activities.

Hand protection

- Wear safety glasses with side shields.

Eye protection

- When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable).

Respiratory protection

- Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure (e.g., an organic vapor cartridge). For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Thermal hazard protection

- Wear cold insulating gloves.

Environmental exposure controls

- None necessary.

Other information

- Wear safety shoes while handling containers.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state

- Solid

Appearance

- Opaque, white crystalline solid.

Molecular mass

- 44 g/mol

Color

- White.

Odor

- No data available

pH

- No data available

Relative evaporation rate (butyl acetate=1)

- 3.7 (carbonic acid)

Relative evaporation rate (ether=1)

- No data available

Melting point

- 78.5 °C

Freezing point

- No data available

Boiling point

- 78.5 °C

Flash point

- Not applicable.

Critical temperature

- 30 °C

Auto-ignition temperature

- Not applicable.

Decomposition temperature

- No data available

Flammability (solid, gas)

- No data available

Vapor pressure

- 5730 kPa

Critical pressure

- 7375 kPa

Relative vapor density at 20 °C

- No data available

Relative density

- 0.82

Specific gravity / density

- 1562 kg/m³

Relative gas density

- 1.52

Solubility

- Water: 2000 mg/l Completely soluble.

Log Pow

- 0.83

Log Kow

- Not applicable.

Viscosity, kinematic

- Not applicable.

Viscosity, dynamic

- Not applicable.

Explosive properties

- Not applicable.

Oxidizing properties

- None.

Explosive limits

- Not applicable.

9.2. Other information

Sublimation point

- 78.5 °C Expansion ratio for solid to gas at sublimation point is 1 to 554.

Additional information

- Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

10.1. Reactivity

- None.

10.2. Chemical stability

- Stable under normal conditions.

10.3. Possibility of hazardous reactions

- None.

10.4. Conditions to avoid

- None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

- Alkali metals, Alkaline earth metals, Acetylide forming metals, Chromium, Titanium > 1022°F (550°C), Uranium (U) > 1382°F (750°C), Magnesium > 1427°F (775°C).

10.6. Hazardous decomposition products

- Electrical discharges and high temperatures decompose carbon dioxide into carbon monoxide and oxygen.

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SECTION 11: Toxicological information

11.1. Information on toxicological effects

- Acute toxicity : Not classified
- Skin corrosion/irritation : Not classified
- Serious eye damage/irritation : Not classified
- Respiratory or skin sensitization : Not classified
- Germ cell mutagenicity : Not classified
- Carcinogenicity : Not classified
- Reproductive toxicity : Not classified
- Specific target organ toxicity (single exposure) : Not classified
- Specific target organ toxicity (repeated exposure) : Not classified
- Aspiration hazard : Not applicable.

SECTION 12: Ecological information

- 12.1. Toxicity : No ecological damage caused by this product.

12.2. Persistence and degradability

- Carbon Dioxide, Solid or Dry Ice (124-38-9) : No ecological damage caused by this product.

12.3. Bioaccumulative potential

- BCF fish 1 : (no bioaccumulation)
- Log Pow : 0.83
- Log Kow : Not applicable.
- Bioaccumulative potential : No ecological damage caused by this product.

12.4. Mobility in soil

- Carbon Dioxide, Solid or Dry Ice (124-38-9) : No data available
- Mobility in soil : No ecological damage caused by this product.
- Ecology - soil : No ecological damage caused by this product.

12.5. Other adverse effects

- Other adverse effects : Can cause frost damage to vegetation.
- Effect on ozone layer : None.
- Global warming potential [CO2=1] : 1
- Effect on the global warming : When discharged in large quantities may contribute to the greenhouse effect.

SECTION 13: Disposal considerations

- 13.1. Waste treatment methods : See Section 6.
- Waste treatment methods : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.
- Waste disposal recommendations : See Section 6.
- Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

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SECTION 14: Transport information

- In accordance with DOT : UN1845 Carbon dioxide, solid, 9
- Transport document description : UN1845
- UN-No. (DOT) : Carbon dioxide, solid
- Proper Shipping Name (DOT) : 9 - Class 9 - Miscellaneous hazardous material 49 CFR 173.140
- Department of Transportation (DOT) Hazard Classes : 9 - Class 9 (Miscellaneous dangerous materials)
- Hazard labels (DOT) : 9 - Class 9 (Miscellaneous dangerous materials)



- DOT Symbols : A - Material is regulated as a hazardous material only when transported by air, W - Material is regulated as a hazardous material only when transported by water

Additional information

- Emergency Response Guide (ERG) Number : 120 (UN1013)
- Other information : No supplementary information available.
- Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

- UN-No. (IMDG) : 1845
- Proper Shipping Name (IMDG) : CARBON DIOXIDE, SOLID (DRY ICE)
- Class (IMDG) : 9 - Miscellaneous dangerous compounds

Air transport

- UN-No. (IATA) : 1845
- Proper Shipping Name (IATA) : Carbon dioxide, solid
- Class (IATA) : 9 - Miscellaneous Dangerous Goods

SECTION 15: Regulatory information

15.1. US Federal regulations

- Carbon Dioxide, Solid or Dry Ice (124-38-9) : Listed on the United States TSCA (Toxic Substances Control Act) inventory
- SARA Section 311/312 Hazard Classes : Immediate (acute) health hazard

15.2. International regulations

- CANADA : Carbon Dioxide, Solid or Dry Ice (124-38-9)
- Classified on the Canadian DSL (Domestic Substances List) : Listed on the Canadian DSL (Domestic Substances List)
- WHMIS Classification : Class A - Compressed Gas
- EU-Regulations : Carbon Dioxide, Solid or Dry Ice (124-38-9)
- Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) : Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
- Classification according to Regulation (EC) No. 1272/2008 (CLP) : Not classified

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15.2.2. National regulations

Carbon Dioxide, Solid or Dry Ice (124-38-9)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on ECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese NCS (Existing & New Chemical Substances) Inventory
Listed on the European Chemicals Inventory (ECHA)
Listed on NZCIC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the Canadian ICL (Ingredient Disclosure List)

15.3. US State regulations

Carbon Dioxide, Solid or Dry Ice(124-38-9)	No
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	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

SECTION 16: Other information

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NFPA health hazard

: 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

NFPA fire hazard

: 0 - Materials that will not burn.

NFPA reactivity

: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.

NFPA specific hazard

: SA - This denotes gases which are simple asphyxiants.



HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability

: 0 Minimal Hazard

Physical

: 0 Minimal Hazard

SDS US (GHS HazCom 2012) - Praxair

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.