

**DRY ICE**

**Identity** : Carbon Dioxide – Solid

**INGREDIENTS / IDENTITY INFORMATION**

CAS No : 124-38-9  
 Chemical Name : Carbon Dioxide  
 Percent : 100

**EINECS / ELINCS**

Proprietary : No  
 NIOSH (RTECS) Number : FF6400000  
 Exposure Limits :  
 Carbon Dioxide :

5000	ppm	(9000 mg/m3)	OSHA	TWA
5000	ppm	(9000 mg/m3)	ACGIH	TWA : 30000 ppm 54,000 mg/me) ACGIH STREL
5000	ppm	(9000 mg/m3)	NIOSH	recommended 10 hour
30,000	ppm	54,000 mg/m3)	NIOSH	recommended STEL
5000	ppm	(9000 mg/m3)	DFG MAK	TWA
10,000	ppm	(18,000 mg/m3)	DFG MAK	60 minute peak, momentary value

Measurement method : Gas  
 Collection bag : Gas chromatography with thermalconductivity  
 Detector : (NIOSH III #S2491)

**PHYSICAL / CHEMICAL CHARACTERISTICS**

Appearance and odor : Colorless, odorless to slightly pungent  
 Boiling Point : -109.4 F  
 Melting Point : 109.3 F  
 Vapor Pressure (MM hg/70F) : 831 PSIA  
 Solubility In Water : Appreciable

**FIRE FIGHTING MEASURES**

Flash Point (test method) : Not applicable  
 Autoignition Temperature : Not applicable  
 Flammable Limits in Air, % by volume : **LOWER** : Not applicable **UPPER** : Not applicable  
 EXTINGUISHING MEDIA :  
 Carbon dioxide cannot catch fire : Use media appropriate for surrounding fire

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## SPECIAL FIRE FIGHTING PROCEDURES

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**WARNING!** Frozen carbon dioxide – extremely cold solid. Vapor can cause rapid suffocation. 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 insulated, loose-fitting gloves and dry ice tongs, or use a dry shovel or scoop. Move packages away from fire area if without risk. Self-contained breathing apparatus may be required by rescue workers. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS	: None Known
HAZARDOUS COMBUSTION PRODUCTS	: Not applicable. Thermal decomposition releases carbon monoxide and oxygen.

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## REACTIVITY DATA

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Dry ice sublimates; if confined in a gas tight container, it will build up a pressure of 850 psig at 70° F. Do not put dry ice in an airtight container or confined space

Stability	: Yes
Conditions To Avoid (Stability)	: Moisture
Materials to Avoid	: Carbonic acid / salt / corrosive chemicals
Hazardous Polymerization Occurrence	: No

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## HEALTH HAZARD DATA

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Route of Entry-Inhalation	: Yes
Route of Entry-Skin	: No
Route of entry-Ingestion	: No
Health Hazard Acute and Chronic	:
Concentration in excess of 1.5% carbon dioxide may cause death. At higher concentrations, displaces oxygen in air below levels necessary to support life.	
Carcinogenicity-NTP	: No
Carcinogenicity-IARC	: No
Carcinogenicity-OSHA	: No
Explanation Carcinogenicity	: None
Signs/Symptoms of Overexposure	: At concentrations
1.5%	: Hyperventilation / headaches / dyspnea/ perspiration.
At 6-10%	: Headaches / dyspnea / perspiration, tremors, visual disturbances.
10%	: Unconsciousness without warning. yogenic burns.
Emergency / first Aid Procedures: Inhalation	: Remove to fresh air. Assisted respirant and supplemental oxygen should be given if not breathing. Frozen tissues should be flooded/soaked with tepid water. Don't use hot water. Obtain medical attention in all cases.

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## PRECAUTIONS FOR SAFE HANDLING AND USE

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### Steps if Material Released / Spill :

Ventilate indoor areas well to avoid hazardous CO<sub>2</sub> concentrations. Ventilate area well and avoid contact with cold vapors / dry ice. CO<sub>2</sub> is heavy gas and will remain in low spots without assisted ventilation.

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### Special Precautions for Handling of Solid Carbon Dioxide :

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Do not handle solid Carbon Dioxide with bare hands. Use heavy gloves, dry ice tongs or plastic scoop or shovel. Handle blocks of dry ice carefully, as injuries can occur if one is accidentally dropped on the feet. 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. Carbon Dioxide sublimates at -78.5°C (-109.3°F); containers should be thermally insulated and kept at the lowest possible temperature to maintain the solid and avoid generation of Carbon Dioxide gas. Storage containers and equipment used with Carbon Dioxide 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. Solid consignment of dry ice in a gas-tight vessel can lead to catastrophic failure of the vessel by over-pressurization. Storage of dry ice should never occur in a gas-tight container.

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## CONTROL MEASURES

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Respiratory Protection : SCBA in oxygen deficient atmospheres where CO<sub>2</sub>>1.5%.  
Do not use air purifying respirators.

### VENTILATION

- |                      |   |  |
|----------------------|---|--|
| Local Exhaust        | : | At point sources of CO <sub>2</sub> vapors.  |
| Mechanical (general) | : | Low lying area are not naturally ventilated. |
| Protective Gloves    | : | Impermeable / loose fitting (leather)        |
| Eye Protection       | : | Safety glasses                               |

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## TRANSPORTATION DATA

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**Shipping information:** Packages should be transported in a secure position in a well ventilated vehicle. Product transported in an enclosed, non ventilated compartment of a vehicle can present serious safety hazards.

## DISPOSAL DATA

**WASTE DISPOSAL METHOD:** Place outside in a protected area with good ventilation and allow to sublime. Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state and local regulations. If necessary, call your local supplier for assistance.

Label Required	:	Yes
Technical Review Date	:	September 1, 2004
Label Date	:	September 1, 2004
Common Name	:	Solid Carbon Dioxide / Dry Ice
Chronic Hazard	:	Yes
Acute Health Hazard	:	Severe
Contact Hazard	:	Slight
Fire Hazard	:	Minimal
Reactivity Hazard	:	None

**Special Hazard Precautions :**

Concentration in excess of 1.5% carbon dioxide may cause death. At higher concentrations, displaces oxygen in air below levels necessary to support life.

Target organs	:	Respiratory system, skin
Protect Eye	:	Yes
Protect Skin	:	Yes
Protect Respiratory	:	Yes

**Notice to reader :**

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