

Safety Data Sheet

Version 1.12

Revision Date 05/21/2018

SDS Number 300000000021

Print Date 05/21/2018

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Carbon dioxide, Solid or Dry Ice

Chemical formula : CO₂

Synonyms : Dry ice (nuggets, pellets, rice or blocks), carbon ice, carbonic anhydride

Product Use Description : General Industrial

Manufacturer/Importer/Distributor : Butane Wholesalers
4811 Carpenter Rd.
Ypsilanti, MI 48197

Telephone : 1-734-572-0444 Corporate

Emergency telephone number (24h) : 800-523-9374 USA
+1 610 481 7711 International

2. HAZARDS IDENTIFICATION

GHS classification

GHS label elements

Hazard pictograms/symbols

No Labeling Applicable

Signal Word: Warning

Hazard Statements:

Safety Data Sheet

Version 1.12

Revision Date 05/21/2018

SDS Number 300000000021

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H281:Contains refrigerated gas; may cause cryogenic burns or injury.
May displace oxygen and cause rapid suffocation.
May increase respiration and heartrate.

Precautionary Statements:

Prevention : P282: Wear cold insulating gloves/face shield/eye protection.
Response : P315 : Get immediate medical advice/attention.
P336 : Thaw frosted parts with lukewarm water. Do not rub affected area.
Storage : P403:Store in a well-ventilated place.

Hazards not otherwise classified

Refrigerated solidified gas. CONTACT WITH PRODUCT MAY CAUSE COLD BURNS OR
Direct contact can cause frostbite.
Dry ice sublimates to carbon dioxide vapor at -109°F (-78°C).
Can cause rapid suffocation.
Avoid breathing gas vapor.
Self contained breathing apparatus (SCBA) may be required.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Concentration (Volume)
Carbon Dioxide	124-38-9	100 %

Concentration is nominal. For the exact product composition, please refer to technical specifications.

4. FIRST AID MEASURES

General advice : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

Eye contact : In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Keep eye wide open while rinsing.

Skin contact : In case of frostbite, obtain medical treatment immediately. As soon as practical, place the affected area in a warm water bath- which has a temperature not to exceed 40 °C (105 °F). Do not rub frozen parts as tissue damage may result. Cover wound with sterile dressing.

Ingestion : Ingestion is not considered a potential route of exposure.

Inhalation : Move to fresh air. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped,

Safety Data Sheet

Version 1.12

Revision Date 05/21/2018

SDS Number 300000000021

Print Date 05/21/2018

trained personnel should begin cardiopulmonary resuscitation immediately. In case of shortness of breath, give oxygen.

Most important symptoms/effects - acute and delayed : Exposure to oxygen deficient atmosphere may cause the following symptoms: Dizziness. Salivation. Nausea. Vomiting. Loss of mobility/consciousness. Shivering fit. Sweating. Blurred vision. Headache. Increased pulse rate. Shortness of breath. Rapid respiration.

Immediate Medical Attention and Special Treatment

Treatment : If exposed or concerned: Get medical attention/advice.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : All known extinguishing media can be used.

Specific hazards : Reactivity

Special protective equipment for fire-fighters : Wear self contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures : Monitor carbon dioxide level. Evacuate personnel to safe areas. Ventilate the area. Monitor oxygen level. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.

Environmental precautions : Prevent further leakage or spillage. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Do not discharge into any place where its accumulation could be dangerous.

Methods for cleaning up : Ventilate the area.

Additional advice : If possible, stop flow of product. Increase ventilation to the release area and monitor oxygen level. Vapor cloud may obscure visibility. Do not spray water directly at leak. If leak is from cylinder or cylinder valve, call the emergency telephone number. If the leak is in the user's system, close the cylinder valve and safely vent the pressure before attempting repairs.
**NEVER HANDLE SOLID CARBON DIOXIDE WITH YOUR BARE HANDS.
USE GLOVES OR DRY ICE TONGS OR A DRY SHOVEL OR SCOOP.**

7. HANDLING AND STORAGE

Handling

Know and understand the properties and hazards of the product before use. Only experienced and properly instructed persons should handle compressed gases/cryogenic liquids. Before using the product, determine its identity by reading the label. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. Before connecting the container, check the complete gas system for suitability, particularly for pressure rating and materials. Before connecting the container for use, ensure that back feed from the system

Safety Data Sheet

Version 1.12

Revision Date 05/21/2018

SDS Number 300000000021

Print Date 05/21/2018

into the container is prevented. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Do not remove or interchange connections. Ensure the complete gas system has been checked for leaks before use. Prevent entrapment of cryogenic liquid in closed systems not protected with relief device. A small quantity of liquid produces large volumes of vaporized gas at atmospheric pressure. Containers used in shipment, storage, and transfer of cryogenic liquid are specially designed, well-insulated containers equipped with a pressure relief device and valves to control pressure. Under normal conditions, these containers will periodically vent product to limit pressure buildup. Ensure that the container is in a well-ventilated area to avoid creating an oxygen-deficient atmosphere. Use adequate pressure relief in systems and piping to prevent pressure buildup; liquid in a closed container can generate extremely high pressures when vaporized by warming. Employ suitable pressure regulating devices on all containers when the gas is being emitted to systems with lower pressure rating than that of the container. Only transfer lines designed for cryogenic liquids shall be used. Do not subject containers to abnormal mechanical shock. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. When doubt exists as to the correct handling procedure for a particular gas, contact the supplier.

Storage

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), ½-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 that open from the top. Lids should fit loosely so the carbon dioxide vapor given off as the solid sublimates can escape into the atmosphere. Carbon dioxide gas is about 1½ times as heavy as air and will accumulate in low-lying areas, so ventilation must be adequate at floor or below grade level.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures

Provide natural or mechanical ventilation to prevent accumulation above exposure limits.
Natural or mechanical to prevent oxygen deficient atmospheres below 19.5% oxygen.
Keep self contained breathing apparatus readily available for emergency use.

Personal protective equipment

- Respiratory protection : Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmosphere.
Air purifying respirators will not provide protection. Users of breathing apparatus must be trained.
- Hand protection : Wear working cold insulated gloves.
If the operation involves possible exposure to a cryogenic liquid, wear loose fitting thermal insulated or cryo-gloves.

Safety Data Sheet

Version 1.12

Revision Date 05/21/2018

SDS Number 300000000021

Print Date 05/21/2018

Eye protection : Safety glasses recommended when handling containers.

Skin and body protection : Safety shoes are recommended when handling cylinders. Cold insulated gloves.

Special instructions for protection and hygiene : Ensure adequate ventilation, especially in confined areas.

Exposure limit(s)

Carbon Dioxide	Time Weighted Average (TWA): ACGIH	5,000 ppm	-
Carbon Dioxide	Short Term Exposure Limit (STEL): ACGIH	30,000 ppm	-
Carbon Dioxide	Recommended exposure limit (REL): NIOSH	5,000 ppm	9,000 mg/m3
Carbon Dioxide	Short Term Exposure Limit (STEL): NIOSH	30,000 ppm	54,000 mg/m3
Carbon Dioxide	Permissible exposure limit: OSHA Z1	5,000 ppm	9,000 mg/m3
Carbon Dioxide	Time Weighted Average (TWA): TN OEL	10,000 ppm	18,000 mg/m3
Carbon Dioxide	Short Term Exposure Limit (STEL): TN OEL	30,000 ppm	54,000 mg/m3

Remarks : Simple asphyxiant.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Solid. Opaque. White crystalline solid.

Odor : No odor warning properties.

Odor threshold : No data available.

pH : 3.7 (carbonic acid)

Melting point/range : -70 °F (-56.6 °C)

Boiling point/range : -109 °F (-78.5 °C)

Flash point : Not applicable.

Evaporation rate : Not applicable.

Flammability (solid, gas) : Refer to product classification in Section 2

Upper/lower explosion/flammability limit : No data available.

Vapor pressure : 831.04 psia (57.30 bara) at 68 °F (20 °C)

Safety Data Sheet

Version 1.12

Revision Date 05/21/2018

SDS Number 300000000021

Print Date 05/21/2018

Water solubility	: 2.000 g/l
Relative vapor density	: 1.52 (air = 1)
Relative density	: 1.03 (water = 1)
Partition coefficient (n-octanol/water)	: Not applicable.
Auto-ignition temperature	: No data available.
Decomposition temperature	: No data available.
Viscosity	: Not applicable.
Molecular Weight	: 44 g/mol

10. STABILITY AND REACTIVITY

Chemical Stability	: Stable under normal conditions.
Conditions to avoid	: No data available.
Materials to avoid	: Carbon steel.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Possibility of hazardous Reactions/Reactivity	: No data available.

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Likely routes of exposure

Effects on Eye	: Contact with solids may cause cold burns/frostbite.
Effects on Skin	: Contact with liquid may cause cold burns/frostbite. May cause severe frostbite.
Inhalation Effects	: Concentrations of 10% CO ₂ or more can produce unconsciousness or death. Unlike simple asphyxiants, carbon dioxide has the ability to cause death even when normal oxygen levels (20-21%) are maintained. Carbon Dioxide is physiologically active, affecting circulation and breathing. At concentrations between 2 and 10%, carbon dioxide can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Asphyxiation

Safety Data Sheet

Version 1.12

Revision Date 05/21/2018

SDS Number 300000000021

Print Date 05/21/2018

may bring about unconsciousness without warning and so rapidly that victim may be unable to protect themselves.

Ingestion Effects : Ingestion is not considered a potential route of exposure.

Symptoms : Exposure to oxygen deficient atmosphere may cause the following symptoms: Dizziness. Salivation. Nausea. Vomiting. Loss of mobility/consciousness. Shivering fit. Sweating. Blurred vision. Headache. Increased pulse rate. Shortness of breath. Rapid respiration.

Acute toxicity

Acute Oral Toxicity : No data is available on the product itself.

Inhalation : Unlike simple asphyxiants, carbon dioxide has the ability to cause death even when normal oxygen levels (20-21%) are maintained. 5% CO₂ has been found to act synergistically to increase the toxicity of certain other gases (CO, NO₂). CO₂ has been shown to enhance the production of carboxy- or met-hemoglobin by these gases possibly due to carbon dioxide's stimulatory effects on the respiratory and circulatory systems.

Acute Dermal Toxicity : No data is available on the product itself.

Skin corrosion/irritation : No data available.

Serious eye damage/eye irritation : No data available.

Sensitization. : No data available.

Chronic toxicity or effects from long term exposures

Carcinogenicity : No data available.

Reproductive toxicity : No data is available on the product itself.

Germ cell mutagenicity : No data is available on the product itself.

Specific target organ systemic toxicity (single exposure) : No data available.

Specific target organ systemic toxicity (repeated exposure) : No data available.

Aspiration hazard : No data available.

Delayed and Immediate Effects and Chronic Effects from Short and Long Term Exposure

Not applicable.

Safety Data Sheet

Version 1.12

Revision Date 05/21/2018

SDS Number 300000000021

Print Date 05/21/2018

12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Aquatic toxicity : Not applicable.

Toxicity to fish - Components

Carbon Dioxide LC50 (1 h) : 240 mg/l

Species : Rainbow trout (Oncorhynchus mykiss).

Carbon Dioxide LC50 (96 h) : 35 mg/l

Species : Rainbow trout (Oncorhynchus mykiss).

Toxicity to other organisms : Not applicable.

Persistence and degradability

Biodegradability : No data is available on the product itself.

Mobility : Because of its high volatility, the product is unlikely to cause ground pollution.

Bioaccumulation : Refer to Section 9 "Partition Coefficient (n-octanol/water)".

Further information

When discharged in large quantities may contribute to the greenhouse effect.

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products : Return unused product in original cylinder to supplier. Contact supplier if guidance is required.

Contaminated packaging : Return cylinder to supplier.

14. TRANSPORT INFORMATION

DOT

UN/ID No. : UN1845 Carbon dioxide, solid, 9

Proper shipping name : Carbon dioxide, solid

Class or Division : 9 - Class 9 - Miscellaneous hazardous material 49 CFR 173.140

Label(s) : 9 - Class 9 (Miscellaneous dangerous materials)

Marine Pollutant : No

Safety Data Sheet

Version 1.12

Revision Date 05/21/2018

SDS Number 300000000021

Print Date 05/21/2018

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.

Emergency Response Guide : 120 (UN1013)
(ERG) Number

Special transport precautions : Avoid transport on vehicles where the load space is separated from the drivers~'s compartment. Ensure vehicle driver is aware of the potential hazards of the load and know 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 secure. Ensure that 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 : CARBON DIOXIDE, SOLID (DRY ICE)
(IMDG) Class (IMDG)

Air transport

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

Miscellaneous dangerous compounds

15. REGULATORY INFORMATION

Toxic Substance Control Act (TSCA) 12(b) Component(s):

None.

Country	Regulatory list	Notification
USA	TSCA	Included on Inventory.
EU	EINECS	Included on Inventory.
Canada	DSL	Included on Inventory.
Australia	AICS	Included on Inventory.
Japan	ENCS	Included on Inventory.
South Korea	ECL	Included on Inventory.
China	SEPA	Included on Inventory.
Philippines	PICCS	Included on Inventory.

Safety Data Sheet

Version 1.12

Revision Date 05/21/2018

SDS Number 300000000021

Print Date 05/21/2018

EPA SARA Title III Section 312 (40 CFR 370) Hazard Classification
Acute Health Hazard

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

This product does not contain any chemicals known to State of California to cause cancer, birth defects or any other harm.

16. OTHER INFORMATION

Prepared by : Butane Wholesalers

Telephone : 1-734-572-0444 Corporate

Preparation Date : 05/21/2018
