Carbon dioxide, Solid or Dry Ice
Safety Data Sheet _____
This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.
Issue date: 08/28/2024 Revision date: 08/28/2024 Version: 1

SECTION 1. Identification

Product Name:	Carbon dioxide, solid
Synonyms:	Dry ice (nuggets, pellets, or blocks), carbonic, carbonic anhydride
Formula:	CO2
SDS Number:	2024V1
Product use:	Industrial and professional; Food and beverage; Use as directed
Supplier's details:	Arctic Dry Ice, LLC 57 Harvey Road Londonderry, NH
Company Phone:	PHONE # 1-800-444-0980
Emergency Phone:	CHEMTREC, 24/7 1-800-424-9300 (USA) or 001-703-527-3887 (International)

SECTION 2. Hazard identification

Classification:	This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200) Gases under pressure and simple asphyxiants.
Signal Word:	Warning

Hazard Statements:
May cause frostbite.
May displace oxygen and cause rapid suffocation.
May increase respiration and heart rate.
May cause cryogenic burns or injury.

Precautionary Statements - Prevention:
Do not handle until all safety precautions have been read and understood
Keep out of reach of children.
If medical advice is needed, have product container or label at hand.
Use and store only outdoors or in a well-ventilated place.
Wear cold insulating gloves, face shield, and eye protection
Do not handle with bare hands. Contact with skin may cause frostbite; flesh may stick to material.
Dry ice sublimes to carbon dioxide vapor at -109°F (-78°C).
Do not put in closed containers
Do not enter confined areas where used or stored unless areas are adequately ventilated
Use a backflow preventive device in piping
Close valve after each use and when empty, do NOT change or force fit connections
Always keep containers in upright position

Precautionary Statements – Response:
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical attention/advice.
IF ON SKIN: Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention

Hazards not otherwise classified (HNOC): N/A

SECTION 3. Composition/information on ingredients

Name: Carbon dioxide, Solid or Dry Ice
Product Code: _____
CAS Number: _____

Name	%	CAS Number	Chemical Formula
Carbon Dioxide	100	124-38-9	CO2

Any concentration shown as a range is to protect confidentiality or is due to batch variation.
There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.
Occupational exposure limits, if available, are listed in Section 8.

SECTION 4. First Aid Measures

Description of first aid measures:

Eye Contact	Immediately flush eyes with plenty of water for 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention.
Skin Contact	MAY CAUSE FROSTBITE. For exposure to liquid, cold vapor, or solid carbon dioxide (dry ice), immediately warm frostbite area with warm water not to exceed 41°C (105°F). Water temperature should be tolerable to normal skin. Maintain skin warming for at least 15 minutes or until normal coloring and sensation have returned to the affected area. In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible.
Inhalation	Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.
Ingestion	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed: No Additional Information Available

Indication of any immediate medical attention and special treatment needed
Notes to physician: Treat symptomatically.
Contact poison treatment specialist immediately if large quantities have been ingested or inhaled

SECTION 5. Firefighting Measures

Suitable extinguishing media
Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media: None.

Specific extinguishing methods

Continue to cool fire exposed cylinders until flames are extinguished. Damaged cylinders should be handled only by specialists.

Specific hazards arising from the chemical
Non-flammable gas. Cylinders may rupture under extreme heat. Do not direct water at source of leak or safety devices; icing may occur. Decomposition products may include the following materials: Carbon Dioxide, Carbon Monoxide

Protective equipment and precautions for firefighters
Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Firefighting Instructions:
Evacuate all personnel from danger area. Ensure adequate ventilation, especially in confined areas. Monitor concentration of released product. Monitor oxygen 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.

SECTION 6. Accidental Release Measures

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.

Environmental Precautions:
Prevent waste from contaminating the surrounding environment. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Dispose of contents in accordance with container supplier instructions.

Methods and materials for containment and cleaning up:
Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

SECTION 7. Handling and Storage

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 tongs 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.

Conditions for safe storage, including any incompatibilities

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 that open from the top. Lids should fit loosely so the carbon dioxide vapor given off as the solid sublimes can escape into the atmosphere. Carbon dioxide gas is about 11⁄2 times as heavy as air and will accumulate in low-lying areas, so ventilation must be adequate at floor or below grade level.

SECTION 8: Exposure controls/personal protection

Control parameters:

Name	Exposure Limits
Carbon dioxide, Solid or Dry Ice	**ACGIH TLV (United States, 3/2019).** STEL: 54000 mg/m³ 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 9000 mg/m³ 8 hours. TWA: 5000 ppm 8 hours. **NIOSH REL (United States, 10/2016).** STEL: 54000 mg/m³ 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 9000 mg/m³ 10 hours. TWA: 5000 ppm 10 hours. **OSHA PEL (United States, 5/2018).** TWA: 9000 mg/m³ 8 hours. TWA: 5000 ppm 8 hours. **OSHA PEL 1989 (United States, 3/1989).** STEL: 54000 mg/m³ 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 18000 mg/m³ 8 hours. TWA: 10000 ppm 8 hours.

Exposure controls:

Appropriate engineering controls:	Oxygen detectors should be used when asphyxiating gases may be released. Ensure exposure is below occupational exposure limits (where available). Systems under pressure should be regularly checked for leakages. Provide adequate general and local exhaust ventilation. Consider the use of a work permit system e.g. for maintenance activities.
Hand protection:	Cold-insulating gloves.
Eye protection:	Wear safety glasses with side shields.
Respiratory protection:	When workplace conditions warrant respirator use, follow a respiratory protection program that meets or exceeds the requirements of the appropriate Health and Safety Regulations. 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. 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

Physical state:	Solid
Appearance:	Opaque. White crystalline snow-like solid.
Molecular mass:	44 g/mol
Color:	White.
Odor:	No odor warning properties.
Odor threshold:	No data available
pH:	3.7 (carbonic acid)

Relative evaporation rate (butylacetate=1):	No data available
Relative evaporation rate (ether=1):	Not applicable.
Melting point:	-78.5 °C
Freezing point:	No data available
Boiling point:	-78.4 °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
Density:	1562 kg/m³
Relative gas density:	1.52
Solubility:	Water: 2000 mg/l Completely soluble.
Partition coefficient n-octanol/water (Log Pow:	0.83
Partition coefficient n-octanol/water (Log Kow):	Not applicable.
Viscosity, kinematic:	Not applicable.
Viscosity, dynamic:	Not applicable.
Explosive properties:	Not applicable.
Oxidizing properties:	None.
Explosive limits:	Not applicable.
Sublimations point:	-78.5 °C

SECTION 10: Stability and reactivity

Reactivity:	None
Chemical stability:	Stable under normal conditions.
Possibility of hazardous reactions:	None.
Conditions to avoid:	None under recommended storage and handling conditions.
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).
Hazardous decomposition products:	Electrical discharges and high temperatures decompose carbon dioxide into carbon monoxide and oxygen.

SECTION 11: Toxicological information

Acute toxicity:	Not available.
Carcinogenicity:	Not available.
Mutagenicity:	Not available.
Teratogenicity:	Not available.
Reproductive toxicity:	Not available.
Irritation/Corrosion:	Not available.
Sensitization:	Not available.
Specific target organ toxicity (single exposure):	Not available.
Specific target organ toxicity (repeated exposure):	Not available.
Aspiration hazard:	Not available.
Information on the likely routes of exposure:	Not available.

Potential acute health effects
Inhalation: May be harmful if inhaled. May cause respiratory irritation.
Ingestion: May be harmful if swallowed and enters airways.
Skin contact: Harmful if absorbed through the skin. May cause skin irritation.
Eye contact: May cause eye irritation.

Potential chronic health effects
Short term exposure
Potential immediate effects: Not available.
Potential delayed effects: Not available.
Long term exposure
Potential immediate effects: Not available.
Potential delayed effects: Not available.

SECTION 12: Ecological information

Toxicity
Ecology – general: No ecological damage caused by this product.

Persistence and degradability
No ecological damage caused by this product.

Bioaccumulative potential
No ecological damage caused by this product.

Mobility in soil
Not available.

Other adverse effects
Can cause frost damage to vegetation.

Global warming potential CO2-1
1

Effect of global warming
When discharged in large quantities may contribute to the greenhouse effect.

SECTION 13: Disposal considerations

Waste treatment methods
Waste treatment methods: See Section 6

Product/Packaging disposal recommendations:
Dispose of contents/container in accordance with container supplier/owner instructions.

SECTION 14: Transport information

In accordance with DOT

Transport document description (DOT):	UN1845 Carbon dioxide, solid, 9
UN-No.(DOT):	UN1845
Proper Shipping Name (DOT):	Carbon dioxide, solid
Class (DOT):	9 - Class 9 (Miscellaneous hazardous materials) 49 CFR 173.140
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 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	184
UN-No. (IMDG):	CARBON DIOXIDE, SOLID (DRY ICE)
Proper Shipping Name (IMDG):	9 - Miscellaneous dangerous substances and articles
Class (IMDG):	

Air transport

UN-No. (IATA):	1845
Proper Shipping Name (IATA):	Carbon dioxide, solid
Class (IATA):	9 - Miscellaneous dangerous substances and articles

SECTION 15: Regulatory information

U.S. Federal regulations

Carbon dioxide, Solid or Dry Ice: Listed on the United States TSCA (Toxic Substances Control Act) inventory

State regulations
Carbon dioxide, Solid or Dry Ice:
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
This product does not require a Safe Harbor warning under California Prop. 65.

International regulations
Carbon dioxide, Solid or Dry Ice:
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Listed on the Canadian DSL (Domestic Substances List)
Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the Canadian IDL (Ingredient Disclosure List)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

SECTION 16: Other information

Hazardous Material Information System (U.S.A.)

Health	/	3
Flammability		0
Physical hazards		0

National Fire Protection Association (U.S.A.)
NFPA health hazard: 3 - Materials that, under emergency conditions, can cause serious or permanent injury.
NFPA fire hazard: 0 - Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.
NFPA instability: 0 - Material that in themselves are normally stable, even under fire conditions.
NFPA specific hazard: SA - Materials that are simple asphyxiants.

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc. The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual. Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

History

Date of printing: 8/28/2024
Date of issue: 8/28/2024
Date of previous issue: 8/28/2024
Version: 1

NOTICE TO READER:

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.