

DRY ICE SAFETY

SAFE HANDLING OF DRY ICE



DO NOT TOUCH

Dry ice is a skin and eye irritant. Avoid contact with skin, mouth, eyes, and clothing. May cause severe frostbite or burns.



DO NOT EAT

Dry ice is harmful if eaten or swallowed. If ingested, seek medical help immediately.



COULD CAUSE SUFFOCATION

Dry ice changes to CO₂ gas as it sublimates. Do not use or store in a confined spaces such as vehicles or garages.



DO NOT PLACE IN AIRTIGHT CONTAINERS

Airtight containers may explode as dry ice converts to CO₂ gas.



DO NOT STORE DRY ICE WHERE PEOPLE SLEEP

Only use dry ice in open or well ventilated areas. Otherwise, a lack of oxygen (suffocation) can occur, causing serious injury or death.

INTENTIONAL MISUSE OF DRY ICE MAY BE HARMFUL OR FATAL.



SAFETY DATA SHEET

This safety data sheet was created pursuant to the requirements of:
US OSHA HCS 2024

Issuing Date 17-Jan-2013

Revision date 09-Apr-2026

Revision Number 7.01

1. Identification

Product identifier

Product Name Carbon Dioxide, Solid

Other means of identification

Synonyms DRY ICE; Gas ID 2187

Other information Classification determined in accordance with Compressed Gas Association standards.

Recommended use of the chemical and restrictions on use

Recommended use Industrial and Specialty Gas Applications

Restrictions on use No information available

Details of the supplier of the safety data sheet

Manufacturer Address

Nippon Sanso Matheson, Inc.
909 Lake Carolyn Parkway
Suite 1100
Irving, TX 75039
General Information: 1-800-416-2505

Emergency telephone number

Emergency telephone CHEMTREC: +1-703-527-3887 (INTERNATIONAL)
1-800-424-9300 (NORTH AMERICA)

2. Hazard(s) identification

Classification of the substance or mixture

Simple asphyxiants	Yes
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Hazards not otherwise classified (HNOC)

Not applicable.

Label elements

Warning

Hazard statements

May displace oxygen and cause rapid suffocation.

Hazards classified under paragraph (d)(1)(ii) of 1910.1200

No information available.

Other information

Contact with product may cause frostbite.

3. Composition/information on ingredients**Substance**

Chemical name	CAS No.	Weight-%	Trade secret
Carbon dioxide, solid	124-38-9	100	-

4. First-aid measures**Description of first aid measures**

Inhalation	Remove person to fresh air and keep comfortable for breathing. Artificial respiration and/or oxygen may be necessary. If breathing has stopped, give artificial respiration. Get medical attention immediately.
Eye contact	In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical attention.
Skin contact	Get immediate medical attention. If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115°F; 41-46°C). If warm water is not available, gently wrap affected parts in blankets.
Ingestion	Get immediate medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms	May cause cryogenic burns. Frostbite. Suffocation.
Effects of Exposure	None known.

Indication of any immediate medical attention and special treatment needed

Note to physicians	Treat symptomatically. For inhalation, consider oxygen.
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5. Fire-fighting measures

Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	None known.
Specific hazards arising from the chemical	Negligible fire hazard.
Hazardous combustion products	Carbon oxides.
Explosion data	
Sensitivity to mechanical impact	None.
Sensitivity to static discharge	None.
Special protective equipment and	Move containers from fire area if you can do it without risk. Cool containers with flooding

precautions for fire-fighters

quantities of water until well after fire is out. Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

6. Accidental release measures**Personal precautions, protective equipment and emergency procedures****Personal precautions**

Ensure adequate ventilation. Evacuate personnel to safe areas. Wear personal protective clothing and equipment, see Section 8.

Methods and material for containment and cleaning up**Methods for containment**

Stop leak if you can do it without risk. Use water spray to reduce vapors or divert vapor cloud drift. Keep unnecessary and unprotected personnel away from spillage. Ventilate the area. Stay upwind and keep out of low areas.

Methods for cleaning up

Eliminate all ignition sources if safe to do so. Damaged cylinders should be handled only by specialists.

Prevention of secondary hazards

Clean contaminated objects and areas thoroughly observing environmental regulations.

7. Handling and storage**Precautions for safe handling****Advice on safe handling**

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Avoid breathing dust. Remove contaminated clothing and shoes. Ensure adequate ventilation. Wear personal protective equipment.

General hygiene considerations

Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product. Wash hands before breaks and immediately after handling the product.

Conditions for safe storage, including any incompatibilities**Storage Conditions**

Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from sunlight. Store locked up. Store in accordance with local regulations. Subject to storage regulations: Keep away from Incompatible materials.

8. Exposure controls/personal protection**Control Parameters****Exposure Limits**

Chemical name	ACGIH TLV	OSHA PEL	NIOSH
Carbon dioxide, solid 124-38-9	TWA: 5000 ppm STEL: 30000 ppm	TWA: 5000 ppm TWA: 9000 mg/m ³ (vacated) TWA: 10000 ppm	TWA: 5000 ppm; TWA: 9000 mg/m ³ ; STEL: 30000 ppm

		(vacated) TWA: 18000 mg/m ³ (vacated) STEL: 30000 ppm (vacated) STEL: 54000 mg/m ³	STEL: 54000 mg/m ³ IDLH: 40000 ppm
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Biological occupational exposure limits This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies.

Appropriate engineering controls

Engineering controls Provide local exhaust ventilation. Apply technical measures to comply with the occupational exposure limits.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear chemical splash goggles and face shield when eye and face contact is possible due to splashing or spraying of material. Contact lenses should not be worn when working with chemicals. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Hand protection Wear insulated gloves.

Skin and body protection Wear appropriate protective, cold insulating clothing.

Respiratory protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Consider warning properties before use. Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode.

9. Physical and chemical properties

Information on basic physical and chemical properties

Appearance	White flakes
Physical state	Solid
Color	White
Odor (includes odor threshold)	No information available
Odor threshold	0.14 ppm,

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Melting point / freezing point	-70 °C / -94 °F	
Boiling point (or initial boiling point or boiling range)	-79 °C / -110 °F	Sublimation point: @ -78.5 °C / -105°F, Atmospheric pressure
Flammability		Not flammable
Flammability Limit in Air		
Upper flammability or explosive limits		No data available
Lower flammability or explosive limits		No data available
Flash point		No data available
Autoignition temperature		No data available
Decomposition temperature		No data available
SADT (°C)		No data available
pH		No data available
pH (as aqueous solution)		No data available
Kinematic viscosity		No data available
Dynamic viscosity		No data available
Solubility	Hydrocarbons, Organic solvents	No data available
Water solubility	1.6%	

Partition coefficient n-octanol/water (log value)		No data available
Vapor pressure (includes evaporation rate)	569 mmHg	@ -82 °C
Evaporation rate		No data available
Density and/or relative density	1.56	@ -79 °C
Bulk density	1.4-1.6 g/cm ³	No data available
Liquid Density		No data available
Relative vapor density	1.5	(air = 1)
Particle characteristics		
Particle Size		No data available
Particle Size Distribution		No data available

Other information

Molecular formula	CO ₂
Molecular weight	44.01
VOC content	No information available
Softening point	No information available

Information with regard to physical hazard classes**Explosives**

Explosive properties	No information available
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Oxidizing properties	No information available
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10. Stability and reactivity

Reactivity	None under normal use conditions.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	None under normal processing.
Conditions to avoid	Excessive heat. Protect from physical damage. Containers may rupture or explode if exposed to heat. Exposure to water. Protect from moisture.
Incompatible materials	Combustible material, Oxidizing materials, Metal salts, Reducing agent, Metal carbide, Metals, Bases.

Hazardous decomposition products Carbon oxides.

11. Toxicological information**Information on likely routes of exposure****Product Information**

Inhalation	Suffocation. Ringing in ears. Nausea. Irregular heartbeat. Headache. Drowsiness. Dizziness. Incoordination. Tingling sensation. Visual disturbances. Convulsions. Coma.
Eye contact	Contact with product may cause frostbite. Blurred vision.
Skin contact	Blisters. Contact with product may cause frostbite.
Ingestion	Specific test data for the substance or mixture is not available.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms	May cause cryogenic burns. Frostbite. Suffocation.
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Acute toxicity	No information available.
<u>Numerical measures of toxicity</u>	Based on available data, the classification criteria are not met.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation	No information available.
Serious eye damage/eye irritation	No information available.
Respiratory or skin sensitization	No information available.
Germ cell mutagenicity	No information available.
Carcinogenicity	No information available.
Reproductive toxicity	No information available.
STOT - single exposure	No information available.
STOT - repeated exposure	No information available.
Aspiration hazard	Not applicable.
Other adverse effects	No information available.
Interactive effects	No information available.

12. Ecological information

Ecotoxicity	Avoid release to the environment.
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<u>Persistence and degradability</u>	No information available.
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<u>Bioaccumulative potential</u>	No information available.
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<u>Mobility in soil</u>	No information available.
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<u>Other adverse effects</u>	No information available.
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13. Disposal considerations**Disposal methods**

Waste from residues/unused	Dispose of contents/container in accordance with local, regional, national, and international
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products regulations as applicable.

Contaminated packaging Do not reuse empty containers.

14. Transport information

DOT Not regulated for Domestic Surface Transportation

Proper shipping name	Carbon dioxide, solid
Transport hazard class(es)	9
DOT Marine Pollutant	NP
Description	UN1845, Carbon dioxide, solid, 9
Emergency Response Guide Number	120

IATA

UN proper shipping name	Carbon dioxide, solid
Transport hazard class(es)	9
Environmental hazards	No
Special Provisions	A48, A151, A805
ERG Code	9L
Description	UN1845, Carbon dioxide, solid, 9

IMDG

UN number or ID number	UN1845
UN proper shipping name	Carbon dioxide, solid
Transport hazard class(es)	9
Marine pollutant indicator	NP
EmS-No.	F-C S-V
Description	UN1845, Carbon dioxide, solid, 9

15. Regulatory information

International Inventories

Contact supplier for inventory compliance status

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications.

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

CAA (Clean Air Act)

This product does not contain any substances regulated as pollutants pursuant to Clean Air Act (CAA).

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and

Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Carbon dioxide, solid 124-38-9	X	X	X

U.S. EPA Label Information

EPA Pesticide Registration Number Not applicable

International Regulations

The Montreal Protocol on Substances that Deplete the Ozone Layer Not applicable

The Stockholm Convention on Persistent Organic Pollutants Not applicable

The Rotterdam Convention Not applicable

16. Other information

NFPA	Health hazards 0	Flammability 0	Instability 0	Special hazards SA
HMIS	Health hazards 0	Flammability 0	Physical hazards 0	Personal protection -

Key or legend to abbreviations and acronyms used in the safety data sheet

List may include phrases which are not applicable to this product

ACGIH	American Conference of Governmental Industrial Hygienists
ADN	Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (Europe)
ADR	Agreement concerning the International Carriage of Dangerous Goods by Road (Europe)
AIIC	Australian Inventory of Industrial Chemicals
ATE	Acute Toxicity Estimate
ASTM	American Society for the Testing of Materials
bar	Biological Reference Values for Chemical Compounds in the Work Area
BAT	Biological tolerance values for occupational exposure
BEL	Biological exposure limits
bw	Body weight
Ceiling	Maximum limit value
CMR	Carcinogen, Mutagen or Reproductive Toxicant
DOT	Department of Transportation (United States)
DSL	Domestic Substances List (Canada)
EmS	Emergency Schedule
ENCS	Existing and New Chemical Substances (Japan)
EPA	U.S. Environmental Protection Agency
GHS	Globally Harmonized System

HMIS	Hazardous Materials Identification System
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IBC	International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
ICAO	International Civil Aviation Organization
IECSC	Inventory of Existing Chemical Substances in China
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organization
ISO	International Organization for Standardization
KECI	Korean Existing Chemicals Inventory
LC50	Lethal Concentration to 50% of a test population
LD50	Lethal Dose to 50% of a test population (Median Lethal Dose)
MARPOL	International Convention for the Prevention of Pollution from Ships
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
n.o.s.	Not Otherwise Specified
NOAEC	No Observed Adverse Effect Concentration
NOAEL	No Observed Adverse Effect Level
NOELR	No Observable Effect Loading Rate
NTP	National Toxicology Program (United States)
NZIoC	New Zealand Inventory of Chemicals
OECD	Organization for Economic Cooperation and Development
OEL	Occupational exposure limits
OSHA	Occupational Safety and Health Administration of the US Department of Labor
PBT	Persistent, Bioaccumulative and Toxic substance
PICCS	Philippines Inventory of Chemicals and Chemical Substances
PMT	Persistent, Mobile and Toxic
PPE	Personal protective equipment
QSAR	Quantitative Structure Activity Relationship
RID	Agreement concerning the International Carriage of Dangerous Goods by Rail (Europe)
SADT	Self-Accelerating Decomposition Temperature
SAR	Structure-activity relationship
SARA	Superfund Amendments and Reauthorization Act
SDS	Safety Data Sheet
SL	Surface Limit
STEL	Short Term Exposure Limit
STOT RE	Specific target organ toxicity - Repeated exposure
STOT SE	Specific target organ toxicity - Single exposure
TCSI	Taiwan Chemical Substance Inventory
TDG	Transport of Dangerous Goods (Canada)
TSCA	Toxic Substances Control Act (United States)
TWA	Time-Weighted Average
UN	United Nations
VOC	Volatile organic compounds
vPvB	Very Persistent and Very Bioaccumulative
vPvM	Very Persistent and Very Mobile
As	Allergenic substance
DS	Dermal Sensitizer
Ot	Ototoxicant
pOt	Ototoxicant - potential to cause hearing disorders
PS	Photosensitizer
RS	Respiratory Sensitizer
S	Sensitizer
poS	Sensitizer - capable of causing occupational asthma

Sa	Simple asphyxiant
Sd	Skin designation
pSd	Skin designation - potential for cutaneous absorption
Sdv	Skin designation - vacated
Sk	Skin notation
dSk	Skin notation - danger of cutaneous absorption
pSk	Skin notation - potential for cutaneous absorption

Key literature references and sources for data used to compile the SDS

U.S. Agency for Toxic Substances and Disease Registry (ATSDR)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
U.S. Environmental Protection Agency
Acute Exposure Guideline Level(s) (AEGl(s))
U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act
U.S. Environmental Protection Agency High Production Volume Chemicals
Food Research Journal
Hazardous Substance Database
International Uniform Chemical Information Database (IUCLID)
Japan GHS Classification
Australia National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIOSH (National Institute for Occupational Safety and Health)
National Library of Medicine's ChemID Plus (NLM CIP)
National Library of Medicine's PubMed database (NLM PUBMED)
U.S. National Toxicology Program (NTP)
New Zealand's Chemical Classification and Information Database (CCID)
International Organization for Economic Co-operation and Development (OECD) Environment, Health, and Safety Publications
International Organization for Economic Co-operation and Development (OECD) High Production Volume Chemicals Program
International Organization for Economic Co-operation and Development (OECD) Screening Information Data Set
United Nations World Health Organization (WHO)

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End of Safety Data Sheet