

SAFETY DATA SHEET

Version 1.9
Revision Date 02.10.2020
Supercedes Version: 1.8

SDS Number 300000000022
Print Date 05.03.2022

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier : Carbon dioxide (Solid) 3mm

CAS No. : 124-38-9

Chemical formula : CO₂

Synonyms : Carbon dioxide (solid)

REACH Registration Number: Listed in Annex IV / V REACH, exempted from registration.

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : Industrial and professional use. Perform risk assessment prior to use.
Restrictions on Use : Food Industries
In beverage for fogging effect, because of the risk of ingestion.

1.3. Details of the supplier of the safety data sheet : Air Products Plc
2 Millennium Gate
Westmere Drive
Crewe
Cheshire

Email Address – Technical Information : GASTECH@airproducts.com

Telephone : +44(0)3457 020202

1.4. Emergency telephone number : +44(0)8085 020202
NHS Direct in England or Wales 0845 46 47 or NHS 24 in Scotland 08454 24 24

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Not a dangerous substance/mixture according to the CLP

2.2. Label elements

Signal Word: Not applicable.

Hazard Statements:

Not applicable.

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2.3. Other hazards

Refrigerated solidified gas. Contact with product may cause cold burns or frostbite.
Avoid breathing vapors and/or aerosols.
Substance does not meet the criteria for PBT and vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

SECTION 3: Composition/information on ingredients

3.1. Substances

Components	EINECS / ELINCS Number	CAS Number	Concentration (Weight)
Carbon dioxide	204-696-9	124-38-9	100 %

Components	Classification (CLP)	REACH Reg. #
Carbon dioxide		*1

*1: Listed in Annex IV / V REACH, exempted from registration.

*2: Registration not required: substance manufactured or imported < 1 t/y.

*3: Registration not required: substance manufactured or imported < 1 t/y for non-intermediate uses.

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

3.2. Mixtures : Not applicable.

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice : Seek medical advice. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately.

Eye contact : In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Skin contact : In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Seek medical advice.

Ingestion : Call a physician immediately. Prevent aspiration of vomit. Turn victim's head to the side.

Inhalation : Move to fresh air.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms : Shivering fit. Sweating. Blurred vision. Headache. Increased pulse rate. Shortness of breath. Rapid respiration. Frostbite.

4.3. Indication of any immediate medical attention and special treatment needed

No data available.

SECTION 5: Firefighting measures

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5.1. Extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire. Carbon dioxide (CO₂).
Dry chemical.
Dry sand.
Limestone powder.

Extinguishing media which must not be used for safety reasons. : Not applicable.

5.2. Special hazards arising from the substance or mixture : Not applicable.

5.3. Advice for firefighters : Use personal protective equipment. Wear self contained breathing apparatus for fire fighting if necessary.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures : Evacuate personnel to safe areas.

6.2. Environmental precautions : No data available.

6.3. Methods and material for containment and cleaning up : Ventilate the area. Place in appropriate chemical waste container.

Additional advice : If possible, stop flow of product.

6.4. Reference to other sections : For more information refer to Sections 8 & 13

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Ensure adequate ventilation. Wear personal protective equipment. Avoid contact with skin and eyes. Keep away from heat. Use personal protective equipment. When using, do not eat, drink or smoke.

7.2. Conditions for safe storage, including any incompatibilities

Keep container below 50 °C (122 °F) in a well ventilated place. Keep only in the original container. Recommended suitable container materials include plastic, stainless, and carbon steels. Keep away from heat.

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7.3. Specific end use(s)

Refer to section 1 or the extended SDS if applicable.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure limit(s)

Carbon dioxide	Time Weighted Average (TWA)	5,000 ppm	9,150 mg/m3	UK. EH40 Workplace Exposure Limits (WELs), as amended
Carbon dioxide	Short Term Exposure Limit (STEL)	15,000 ppm	27,400 mg/m3	UK. EH40 Workplace Exposure Limits (WELs), as amended

If applicable, refer to the extended section of the SDS for further information on CSA.

DNEL: Derived no effect level (Workers)
None available.

PNEC: predicted no effect concentration
None available.

8.2. Exposure controls

Engineering measures

Provide good ventilation and/or local exhaust to prevent accumulation of concentrations above exposure limits.

Personal protective equipment

- Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Loose fitting thermal insulated or leather gloves.
Standard EN 511 - Cold insulating gloves.
- Eye/face Protection : Safety glasses
- Environmental Exposure Controls : If applicable, refer to the extended section of the SDS for further information on CSA.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- (a/b) Physical state/Colour : Solid. Refrigerated solidified gas. White.
- (c) Odour : No odor warning properties.
- (d) Density : 0.0018 g/cm3 (0.112 lb/ft3) at 21 °C (70 °F)
Note: (as vapor)
- (e) Relative Density : 1.5 (water = 1)

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- (f) Melting point / freezing point : -70 °F (-56.6 °C)
- (g) Boiling point/range : No data available.
- (h) Vapor pressure : 831.04 psia (57.30 bara) at 68 °F (20 °C)
- (i) Water solubility : 2.000 g/l
- (j) Partition coefficient:
n-octanol/water [log Kow] : 0.83
- (k) pH : Not applicable for gases and gas mixtures.
- (l) Viscosity : No reliable data available.
- (m) Particle characteristics : Not applicable for gases and gas mixtures.
- (n) Upper and lower explosion /
flammability limits : Non flammable.
- (o) Flash point : Not applicable for gases and gas mixtures.
- (p) Autoignition temperature : Non flammable.
- (q) Decomposition
temperature : Not applicable.

9.2. Other information

- Explosive properties : Not applicable.
- Oxidizing properties : Not applicable.
- Molecular Weight : 44.01 g/mol
- Odor threshold : Odour threshold is subjective and inadequate to warn of overexposure.
- Evaporation rate : Not applicable for gases and gas mixtures.
- Flammability (solid, gas) : Refer to product classification in Section 2
- Sublimation point : -78.5 °C
- Relative vapor density : 1.519 (air = 1) Heavier than air.

SECTION 10: Stability and reactivity

- 10.1. Reactivity : No reactivity hazard other than the effects described in sub-sections below.
- 10.2. Chemical stability : Stable under normal conditions.

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10.3. Possibility of hazardous reactions : No data available.

10.4. Conditions to avoid : Direct sources of heat.

10.5. Incompatible materials : Bases.

10.6. Hazardous decomposition products : No data available.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure

Effects on Eye : No data available.

Effects on Skin : No data available.

Inhalation Effects : Concentrations of 10% CO₂ or more can produce unconsciousness or death.

Ingestion Effects : No data available.

Symptoms : Shivering fit. Sweating. Blurred vision. Headache. Increased pulse rate. Shortness of breath. Rapid respiration. Frostbite.

Acute toxicity

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

Acute Inhalation Toxicity : In high concentrations cause rapid circulatory insufficiency. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness. 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.

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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.

SECTION 12: Ecological information

12.1. Toxicity

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

Toxicity to other organisms : No data is available on the product itself.

12.2. Persistence and degradability

No data available.

12.3. Bioaccumulative potential

No data is available on the product itself.

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

If applicable, refer to the extended section of the SDS for further information on CSA.

12.6. Other adverse effects

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

Effect on the ozone layer	:	No known effects from this product.
Ozone Depleting Potential	:	None

Effect on global warming	:	When discharged in large quantities may contribute to the greenhouse effect.
Global Warming Potential	:	1

SECTION 13: Disposal considerations

13.1. Waste treatment : Dispose of as a non-hazardous solid waste. Contact supplier if guidance is

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methods required.

Contaminated packaging : Dispose of container and unused contents in accordance with federal, state, and local requirements.

SECTION 14: Transport information

14.1. UN number

14.2. UN proper shipping name

Transport by air (ICAO-TI / IATA-DGR) : Carbon dioxide, solid
Transport by sea (IMDG) : CARBON DIOXIDE, SOLID

14.3. Transport hazard class(es)

Transport by air (ICAO-TI / IATA-DGR)
Class or Division : 9

Transport by sea (IMDG)
Class or Division : 9

14.4. Packing group

Transport by road/rail (ADR/RID) : Not applicable.
Transport by air (ICAO-TI / IATA-DGR) : III
Transport by sea (IMDG) : III

14.5. Environmental hazards

Transport by road/rail (ADR/RID)
Marine Pollutant : No

Transport by air (ICAO-TI / IATA-DGR)
Marine Pollutant : No

Transport by sea (IMDG)
Marine Pollutant : No
Segregation Group : None

14.6. Special precautions for user

Transport by road/rail (ADR/RID)
Not dangerous goods

Transport by air (ICAO-TI / IATA-DGR)
Passenger and Cargo Aircraft : Transport allowed
Cargo Aircraft only : Transport allowed

Further Information

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. The transportation information is not intended to convey all specific regulatory data relating to this

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material. For complete transportation information, contact customer service.

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

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.

Other Regulations

REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Regulation (EC) No 1272/2008 the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

Control of Substances Hazardous to Health Regulations 2002 (as amended)

Health and Safety at Work etc. Act 1974

Management of Health and Safety at Work Regulations (Northern Ireland) 2000 c.388, and as amended

Management of Health and Safety at Work Regulations 1999 (S.I. number 3242)

The Health and Safety at Work etc. Act 1974 (Application to Environmentally Hazardous Substances) Regulations 2002 (England and Wales and Scotland) 11 March 2002 c.282, and as amended

Health and Safety at Work Order (Application to Environmentally Hazardous Substances) Regulations (Northern Ireland) 2003 (Northern Ireland) 14 March 2003 c52, and as amended

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The Control of Major Accident Hazards Regulations 2015 c483

The Control of Major Accident Hazards Regulations (Northern Ireland) 2015 c325

The Pressure Systems Safety Regulations 2000 (S.I. number 128) link to Pressure Equipment Directive (97/23/EC)

The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2011 c1885, and as amended

The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations with amendments (Northern Ireland) 2011 c365

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 c.407

The Water Environment Regulations (Northern Ireland) 2017 c.81

Pollution Prevention and Control Act 1999 c.24

The Fluorinated Greenhouse Gases Regulations 2015 c.310

The Fluorinated Greenhouse Gases Regulations (Northern Ireland) 2015 c.425

The Acetylene Safety (England and Wales and Scotland) Regulations 2014 c.1639

The Highly Flammable Liquids and Liquefied Petroleum Gases Regulations 1972 c.917

The Highly Flammable Liquids and Liquefied Petroleum Gases Regulations (Northern Ireland) 1975 c.256

Dangerous Substances and Explosive Atmospheres Regulations (Northern Ireland) 2003 c.152

The Dangerous Substances and Explosive Atmospheres Regulations 2002 c.2776

Pollution Prevention and Control Act 1999

The Environmental Permitting (England and Wales) Regulations 2016

Ozone Depleting Substances Regulations 2015

15.2. Chemical safety assessment

A CSA does not need to be carried out for this product.

SECTION 16: Other information

Ensure all national/local regulations are observed.

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Indication of Method:
Calculation method

Abbreviations and acronyms:

ATE - Acute Toxicity Estimate
CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
EINECS - European Inventory of Existing Commercial Chemical Substances
ELINCS - European List of Notified Chemical Substances
CAS# - Chemical Abstract Service number
PPE - Personal Protection Equipment
Kow - octanol-water partition coefficient
DNEL - Derived No Effect Level
LC50 - Lethal Concentration to 50 % of a test population
LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose)
NOEC - No Observed Effect Concentration
PNEC - Predicted No Effect Concentration
RMM - Risk Management Measure
OEL - Occupational Exposure Limit
PBT - Persistent, Bioaccumulative and Toxic
vPvB - Very Persistent and Very Bioaccumulative
STOT - Specific Target Organ Toxicity
CSA - Chemical Safety Assessment
EN - European Standard
UN - United Nations
ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road
IATA - International Air Transport Association
IMDG - International Maritime Dangerous Goods
RID - Regulations concerning the International Carriage of Dangerous Goods by Rail
WGK - Water Hazard Class

Key literature references and sources for data:

ECHA - Guidance on the compilation of safety data sheets
ECHA - Guidance on the application of the CLP Criteria
ARIEL database

Prepared by : Air Products and Chemicals, Inc. Global EH&S Department

For additional information, please visit our Product Stewardship web site at
<http://www.airproducts.com/productstewardship/>

This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws. COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

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