

Carbon Dioxide, Compressed

Issue date: 25/05/2018 Version: 4.0 SDS reference: MY000409 Revision date: 09/11/2024

SECTION 1: Identification of the hazardous chemical and of the supplier

Product identifier 1.1.

> Product form Substance

Trade name i) Carbon Dioxide, Compressed (Industrial)

ii) Carbon Dioxide, Compressed (Food) iii) Linde Medicinal Carbon Dioxide 100% v/v iv)Carbon Dioxide, Compressed (Purified) v) Carbon Dioxide, Compressed (CP) vi) Carbon Dioxide, Compressed (Sureflow)

CAS-No. 124-38-9 Formula CO2

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

> Recommended use Industrial use Restrictions on use None.

1.3. Supplier's details

> Linde Gas Products Malaysia Sdn Bhd (453560-K) P.O. Box 10633, GPO Kuala Lumpur, 50670 WPKL.

No. 1, Jalan Graphite 3, Kawasan Perindustrian Bandar Mahkota Banting,

42700 Banting, Kuala Langat, Selangor Darul Ehsan.

T oll Free: 1800 883 888 / +603 5651 7000

csc.lg.my@linde.com

Emergency telephone number 1.4.

> Emergency phone number (24h): 1800 883 888 Poison center: Unit HAZMAT Malaysia, tel: 999

SECTION 2: Hazards identification

Classification of the hazardous chemical 2.1.

Classification according to Industry Code of Practice on chemicals classification and hazard communication (2014)

Press. Gas (Lig.) H280

Label elements 2.2.

Labelling according to Industry Code of Practice on chemicals classification and hazard communication (2014)

Hazard pictograms (GHS MY)

Signal word (GHS MY) : Warning

Hazard statements (GHS MY) : H280 - Contains gas under pressure; may explode if heated

Precautionary statements (GHS MY)

: P410+P403 - Protect from sunlight. Store in a well-ventilated place - Storage

2.3. Other hazards not contributing to the classification

Other hazards which do not result in

classification

Contact with liquid may cause cold burns/frostbite, In high concentrations CO2 causes rapid circulatory insufficiency even at normal levels of oxygen concentration. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness and death.

SECTION 3: Composition and information of the ingredients of the hazardous chemical

3.1. Substances



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Name	Product identifier	0/0
Carbon Dioxide, Compressed (Main constituent)	(CAS-No.) 124-38-9	99 – 100

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

Description of first aid measures 4.1.

> First-aid measures after inhalation Remove person to fresh air and keep comfortable for breathing. Remove victim to uncontaminated area

wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Perform

cardiopulmonary resuscitation if breathing stopped.

First-aid measures after skin contact In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical

assistance. Wash skin with plenty of water.

First-aid measures after eye contact Immediately flush eyes thoroughly with water for at least 15 minutes. Rinse eyes with water as a

precaution.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure. Call a poison center or a doctor if you feel

unwell.

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

> Most important symptoms and effects, both acute and delayed

: In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Low concentrations of CO2 cause increased respiration and

headache. See section 11.

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

> Other medical advice or treatment : None.

SECTION 5: Fire-fighting measures

5.1. Extinguishing media

> Suitable extinguishing media : Water spray or fog. Water spray. Dry powder. Foam.

Unsuitable extinguishing media : Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

> : No reactivity hazard other than the effects described in sub-sections below. Reactivity : No reactivity hazard other than the effects described in sub-sections below. Reactivity in case of fire

Hazardous combustion products : None.

Special protective equipment and precautions for fire-fighters 5.3.

> Protection during firefighting Do not attempt to take action without suitable protective equipment. Self-contained breathing

apparatus. Complete protective clothing.

Special protective equipment for fire

fighters

In confined space use self-contained breathing apparatus. Standard protective clothing and equipment

(Self Contained Breathing Apparatus) for fire fighters. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters. EN 15090 Footwear for firefighters. EN

443 Helmets for fire fighting in buildings and other structures.

Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may

cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. If possible, stop flow of product. Use water spray or fog to knock down fire fumes if possible. Move

containers away from the fire area if this can be done without risk.

EAC code : 2T



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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures

Try to stop release. Evacuate area. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Act in accordance with local emergency plan. Stay upwind. Oxygen detectors should be used when asphyxiating gases may be released.

For non-emergency personnel 6.1.1.

> **Emergency procedures** : Ventilate spillage area.

6.1.2. For emergency responders

> Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to

section 8: "Exposure controls/personal protection".

6.2. **Environmental precautions**

Avoid release to the environment. Try to stop release.

6.3. Methods and material for containment and cleaning up

> Methods and material for containment and cleaning up

: Ventilate area. Keep area evacuated and free from ignition sources until any spilled liquid has

evaporated (ground free from frost)

SECTION 7: Handling and storage

Precautions for safe handling 7.1.

Precautions for safe handling

: Ensure good ventilation of the work station. Wear personal protective equipment.

Hygiene measures

: Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

Safe handling of the gas receptacle

: Refer to supplier's container handling instructions. Do not allow backfeed into the container. Protect containers from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. If user experiences any difficulty operating valve discontinue use and contact supplier. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Keep container valve outlets clean and free from contaminants particularly oil and water. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to transfer gases from one cylinder/container to another. Never use direct flame or electrical heating devices to raise the pressure of a container. Do not remove or deface labels provided by the supplier for the identification of the content of the container. Suck back of water into the container must be prevented. Open valve slowly to avoid pressure shock.

Safe use of the product

Containers, which contain or have contained flammable or explosive substances, must not be inerted with liquid carbon dioxide. Potential production of solid CO2 particles must be ruled out. In order to rule out potential electrostatic discharge production, the system must be adequately grounded. Do not breathe gas. Avoid release of product into work area. The product must be handled in accordance with good industrial hygiene and safety procedures. Only experienced and properly instructed persons should handle gases under pressure. Consider pressure relief device(s) in gas installations. Ensure the complete gas system was (or is regularily) checked for leaks before use. Do not smoke while handling product. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Avoid suck back of water, acid and alkalis.

Conditions for safe storage, including any incompatibilities 7.2.

Storage conditions

: Protect from sunlight. Store in a well-ventilated place. Keep cool.

Conditions for safe storage, including

any incompatibilities

Observe all regulations and local requirements regarding storage of containers. Containers should not be stored in conditions likely to encourage corrosion. Container valve quards or caps should be in place. Containers should be stored in the vertical position and properly secured to prevent them from falling over. Stored containers should be periodically checked for general condition and leakage. Keep container below 50°C in a well ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials.



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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

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v) Carbon Dioxide, Compressed (CP)

vi) Carbon Dioxide, Compressed (Sureflow) (124-38-9)

Malaysia	Local name	Karbon dioksida # Carbon dioxide
Malaysia	PEL (OEL TWA)	9000 mg/m³
Malaysia	PEL (OEL TWA)	5000 ppm
United Kingdom	WEL TWA (OEL TWA)	9150 mg/m³
United Kingdom	WEL TWA (OEL TWA)	5000 ppm
United Kingdom	WEL STEL (OEL STEL)	27400 mg/m³
United Kingdom	WEL STEL (OEL STEL)	15000 ppm
USA - ACGIH	ACGIH OEL TWA	5000 ppm
USA - ACGIH	ACGIH OEL STEL	30000 ppm
USA - ACGIH	Remark (ACGIH)	Asphyxia

Exposure limit values for the other components

No additional information available

8.2. Monitoring

8.3. Appropriate engineering controls

Appropriate engineering controls

: Ensure good ventilation of the work station. Provide adequate general and local exhaust ventilation. Systems under pressure should be regularily checked for leakages. Ensure exposure is below occupational exposure limits (where available). Oxygen detectors should be used when asphyxiating gases may be released. Consider the use of a work permit system e.g. for maintenance activities. CO2 detectors should be used when CO2 may be released.

8.4. Personal protective equipment

Wear safety shoes while handling containers.

Wear safety shoes while handling containers. Standard EN ISO 20345 - Personal protective equipment - Safety footwear.

Hand protection:

Wear working gloves when handling gas containers. Standard EN 388 - Protective gloves against mechanical risks, performance level 1 or higher. Recommended types include wrist gloves from leather or synthetic material with equivalent performance, fabric gloves, fabric gloves with leather palms. Wear cold insulating gloves when transfilling or breaking transfer connections. Standard EN 511 - Cold insulating gloves.

Eye protection:

Safety glasses. Wear goggles when transfilling or breaking transfer connections. Standard EN 166 - Personal eye-protection - specifications

Skin and body protection:

Wear suitable protective clothing

Respiratory protection:

Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known. Use gas filters with full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers. Gas filters do not protect against oxygen deficiency. Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres. Standard EN 14387 - Gas filter(s), combined filter(s) and standard EN136, full face masks . Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.



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Thermal hazard protection : None in addition to the above sections.

Environmental exposure controls: None necessary. Avoid release to the environment.

SECTION 9: Physical and chemical properties

Physical state : Gas

Appearance : No data available Colour : Colourless.

Odour : No odour warning properties.

Odour threshold : Odour threshold is subjective and inadequate to warn of overexposure.

pH : Not applicable for gases and gas mixtures.

Melting point, Freezing point : -78.5 °C At atmospheric pressure dry ice sublimes into gaseous carbon dioxide.

Boiling point : -56.6 °C

Flash point : Not applicable for gases and gas mixtures.

Critical temperature : 30 °C

Auto-ignition temperature : Non flammable.

Decomposition temperature : Not applicable.

Flammability : Non flammable.

Vapour pressure : Vapour pressure: 57.3 bar(a)

Vapour pressure at 50°C: No reliable data available.

Evaporation rate : Relative evaporation rate (ether=1): Not applicable for gases and gas mixtures.

Explosive limits: Non flammable.Lower explosion limit: No data availableUpper explosion limit: No data availableExplosive properties: Not applicable.Minimum ignition energy: No data available

Solubility : Water: 2000 mg/l Completely soluble.

Density : Relative density: 0.82

Relative density : Relative vapour density at 20°C: Not applicable.

Relative gas density: 1.52

Viscosity : Viscosity, dynamic: Not applicable.

Viscosity, kinematic: 1.52Not applicable.

Critical pressure : 7375 kPa
Gas group : Press. Gas (Liq.)

Partition coefficient n-octanol/water : 0.83

(Log Pow)

Molecular mass : 44 g/mol
Oxidising properties : Not applicable.

Additional information : Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

Chemical stability: Stable under normal conditions.Conditions to avoid: Avoid moisture in installation systems.



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Hazardous decomposition products · None

Incompatible materials : None. For additional information on compatibility refer to ISO 11114.

Possibility of hazardous reactions

Reactivity : No reactivity hazard other than the effects described in sub-sections below.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral) : Not classified Acute toxicity (dermal) : Not classified Acute toxicity (inhalation) : Not classified Skin corrosion or irritation : Not classified

pH: Not applicable for gases and gas mixtures.

Serious eye damage or eye irritation : Not classified Respiratory or skin sensitisation : Not classified Germ cell mutagenicity : Not classified Carcinogenicity : Not classified Reproductive toxicity : Not classified Specific target organ toxicity (STOT) -: Not classified

single exposure

Specific target organ toxicity (STOT) - : Not classified

repeated exposure

Aspiration hazard : Not applicable

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vi) Carbon Dioxide, Compressed (Sureflow) (124-38-9)

Viscosity, kinematic (calculated value) (40 °C) Not applicable

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

Hazardous to the aquatic environment,

short-term (acute)

: Not classified

Hazardous to the aquatic environment,

: Not classified

long-term (chronic)

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iv)Carbon Dioxide, Compressed (Purified)

v) Carbon Dioxide, Compressed (CP)

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Partition coefficient n-octanol/water (Log Kow)	Not applicable for gas mixtures.
Partition coefficient n-octanol/water (Log Pow)	0.83



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12.2. Persistence and degradability

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iv)Carbon Dioxide, Compressed (Purified)

v) Carbon Dioxide, Compressed (CP)

vi) Carbon Dioxide, Compressed (Sureflow) (124-38-9)

Persistence and degradability No ecological damage caused by this product.

12.3. Bioaccumulative potential

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v) Carbon Dioxide, Compressed (CP)

vi) Carbon Dioxide, Compressed (Sureflow) (124-38-9)

vi) Carbon Dioxide, Compressed (Surenow) (124-38-9)	
Partition coefficient n-octanol/water (Log Pow)	See section 12.1 on ecotoxicology
Partition coefficient n-octanol/water (Log Kow)	See section 12.1 on ecotoxicology
Bioaccumulative potential	No ecological damage caused by this product.

12.4. Mobility in soil

i)	Carbon Dioxide, Compressed	(Industrial)	į

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iii) Linde Medicinal Carbon Dioxide 100% v/v

iv)Carbon Dioxide, Compressed (Purified)

v) Carbon Dioxide, Compressed (CP)

vi) Carbon Dioxide. Compressed (Sureflow) (124-38-9)

vi) Calbuii Dioxide, Colliplessed (Suleilow) (124-38-9)	
Mobility in soil	No additional information available
Partition coefficient n-octanol/water (Log Pow)	See section 12.1 on ecotoxicology
Partition coefficient n-octanol/water (Log Kow)	See section 12.1 on ecotoxicology
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.

12.5. Other adverse effects

Ozone : Not classified

Effect on global warming : When discharged in large quantities may contribute to the greenhouse effect, Contains greenhouse

gas(es).

GWP 20 years : 1
GWP 100 years : 1
GWP 500 years : 1
Effect on the ozone layer : None.

Other adverse effects : No known effects from this product.

SECTION 13: Disposal information

13.1. Disposal methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions. Do not

discharge into any place where its accumulation could be dangerous. May be vented to atmosphere in a well ventilated place. Discharge to atmosphere in large quantities should be avoided. Return unused

product in original container to supplier.

Additional information : External treatment and disposal of waste should comply with applicable local and/or national

regulations.

{ Refer to the EIGA code of practice (Doc.30 "Disposal of Gases", downloadable at

http://www.eiga.org) for more guidance on suitable disposal methods. Dispose of container via supplier only. Discharge, treatment, or disposal may be subject to national, state, or local laws.



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SECTION 14: Transportation information

14.1. UN number

 UN-No. (UN RTDG)
 : 1013

 UN-No. (IMDG)
 : 1013

 UN-No. (IATA)
 : 1013

14.2. Proper Shipping Name

Proper Shipping Name (UN RTDG): CARBON DIOXIDEProper Shipping Name (IMDG): CARBON DIOXIDEProper Shipping Name (IATA): Carbon dioxide

14.3. Transport hazard class(es)

UN RTDG

Transport hazard class(es) (UN RTDG) : 2.2 Danger labels (UN RTDG) : 2.2



IMDG

Transport hazard class(es) (IMDG) : 2.2 Danger labels (IMDG) : 2.2



IATA

Transport hazard class(es) (IATA) : 2.2 Danger labels (IATA) : 2.2



14.4. Packing group

Packing group (UN RTDG): Not applicablePacking group (IMDG): Not applicablePacking group (IATA): Not applicable

14.5. Environmental hazards

Dangerous for the environment : No Marine pollutant : No

Other information : No supplementary information available



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14.6. Special precautions for user

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.

- UN RTDG

Special provisions (UN RTDG) : 274 Limited quantities (UN RTDG) : 120 ml

Excepted quantities (UN RTDG) : E1
Packing instruction (UN RTDG) : P200
Portable tank and bulk container : T50

special instructions (UN RTDG)

- IMDG

Special provisions (IMDG): 274Limited quantities (IMDG): 120 mlExcepted quantities (IMDG): E1Packing instructions (IMDG): P200Tank instructions (IMDG): T50

EmS-No. (Fire) : F-C - FIRE SCHEDULE Charlie - NON-FLAMMABLE GASES

EmS-No. (Spillage) : S-V - SPILLAGE SCHEDULE Victor - GASES (NON-FLAMMABLE, NON-TOXIC)

Stowage category (IMDG) : A

Properties and observations (IMDG) : Liquefied, non-flammable gas. Heavier than air (1.5). Cannot remain in the liquid state above 31°C.

MFAG-No : 120

- IATA

PCA Excepted quantities (IATA) : E1
PCA Limited quantities (IATA) : Forbidden
PCA limited quantity max net quantity : Forbidden

(IATA)

PCA packing instructions (IATA) : 200
PCA max net quantity (IATA) : 75kg
CAO packing instructions (IATA) : 200
CAO max net quantity (IATA) : 150kg
ERG code (IATA) : 2L

- 14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
- 14.8. Hazchem or Emergency Action Code
 EAC code : 2T.

SECTION 15: Regulatory information

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

Occupational Safety and Health Act 1994 and relevant regulations:

Occupational Safety and Health (Classification, Labeling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013. Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations 2000.



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Environment Quality Act 1974 & regulations:

Environment Quality (Clean Air) Regulations 2014.

Environmental Quality (Scheduled Wastes) Regulations 2005.

15.2. Chemical safety assessment

SECTION 16: Other information

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 : 16/05/2023

Data sources : Lisam OEL.

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

CAS# - Chemical Abstract Service number PPE - Personal Protection Equipment

LC50 - Lethal Concentration to 50 % of a test population

RMM - Risk Management Measures
PBT - Persistent, Bioaccumulative and Toxic
vPvB - Very Persistent and Very Bioaccumulative
STOT- SE: Specific Target Organ Toxicity - Single Exposure

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 code - International Maritime Dangerous Goods

RID - Regulations concerning the International Carriage of Dangerous Goods by Rail

WGK - Water Hazard Class

STOT - RE: Specific Target Organ Toxicity - Repeated Exposure

Training advice : The hazard of asphyxiation is often overlooked and must be stressed during operator training.

This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.