

CARBON DIOXIDE, Solid (CO₂), Dry Ice LNS201

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Trade name : CARBON DIOXIDE, Solid (CO₂), Dry Ice
MSDS Nr : LNS201
Use : Freezing applications. Medical applications. Scientific Applications. Special effects.
Chemical formula : CO₂
Company identification : Liquid Nitrogen Services Pty Ltd
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2 HAZARDS IDENTIFICATION

Hazard classification : Classified as a dangerous good by the criteria of the ADG code.
Not classified as hazardous according to NOHSC criteria.
Hazards identification : Refrigerated solidified gas. Contact with product may cause cold burns or frostbite.
In high concentrations may cause asphyxiation.
Closed containers may generate internal gas pressure, causing containers to rupture/explode.

3 COMPOSITION /INFORMATION ON INGREDIENTS

Substance / Preparation : Substance.

Substance name	Contents	CAS No	EC No	Annex No	Classification
Carbon dioxide (solid)	: 100 %	124-38-9	204-696-9	-----	

Contains no other components or impurities which will influence the classification of the product.

4 FIRST AID MEASURES

First aid measures

- **Inhalation** : 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.
Remove victim to uncontaminated area wearing self contained Breathing apparatus. Keep victim warm and rested. Call a doctor.
Apply artificial respiration if breathing stopped.
- **Skin/eye contact** : In case of frostbite spray with water for at least 15 minutes.
Apply a sterile dressing.
Obtain medical assistance.
- **Ingestion** : Potential choking hazard exists for dry ice pellets to lodge in the airway if swallowed. Seek urgent medical advice.

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5 FIRE-FIGHTING MEASURES

Specific hazards	: Exposure to fire may cause containers to rupture/explode.
Hazardous combustion products	: None.
Extinguishing media	
- Suitable extinguishing media	: All known extinguishers can be used. Do not use water jet to extinguish
Advice for fire-fighters	: Use fire control measures appropriate for the surrounding fire. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. Use water spray or fog to knock down fire fumes if possible. In confined space use self-contained breathing apparatus. Standard protective clothing and equipment

6 ACCIDENTAL RELEASE MEASURES

Personal precautions	: Evacuate area. Use protective clothing. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation.
Environmental precautions	: Try to stop release. Prevent from entering sewers, basements and work pits, or any place where its accumulation can be dangerous.
Clean up methods	: Ventilate area.

7 HANDLING AND STORAGE

Storage	: Minimize exposure to water contacting this material. Ventilate to prevent pressure build up. Closed containers may generate internal gas pressure. Ensure lids on containers are loose-fitting to avoid build-up of gas pressure. Observe all regulations and local requirements regarding storage of containers. Keep container below 50°C in a well ventilated place.
Handling	: The substance must be handled in accordance with good industrial hygiene and safety procedures. Do not smoke while handling product. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Use insulating gloves and Wear safety glasses with side shields. Do not breathe gas. Refer to supplier's container handling instructions.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal protection	: Ensure adequate ventilation. Protect eyes, face and skin from contact with product.
Occupational Exposure Limits (OEL)	: Carbon dioxide (solid) :WEL-LTEL-UK [mg/m ³] : 9150 Carbon dioxide (solid) : WEL-LTEL-UK [ppm] : 5000 Carbon dioxide (solid) : WEL-STEL-UK [mg/m ³] : 27400 Carbon dioxide (solid) : WEL-STEL-UK [ppm] : 15000

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9 PHYSICAL AND CHEMICAL PROPERTIES

Physical state at 20 °C	: Gas.
Physical state	: Refrigerated solidified gas.
Colour	: White.
Odour	: No odour warning properties.
Molecular weight	: 44g/mol
Melting point	: 78.5°C
Boiling point	: 56.6°C (s)
Critical temperature	: 30°C
Vapour pressure [20°C]	: 57.3 bar
Relative density, gas (air=1)	: 1.52
Relative density, liquid (water=1)	: 1.03
Solubility in water [mg/l]	: 2000
Partition coefficient n-octano/water	: 0.83 (low kow)
Flammability range [vol% in air]	: Non flammable.
Other data	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

10 STABILITY AND REACTIVITY

Stability and reactivity	: Stable under normal conditions. Water on solid carbon dioxide increases sublimation and greatens the risk of asphyxiation.
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11 TOXICOLOGICAL INFORMATION

Toxicity information	: 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% CO ₂ has been found to act synergistically to increase the toxicity of certain other gases (CO, NO ₂). CO ₂ 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 system.
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12 ECOLOGICAL INFORMATION

Ecological effects information	: When discharged in large quantities may contribute to the greenhouse effect. Can cause frost damage to vegetation.
Global warming potential [CO ₂ =1]	: 1

13 DISPOSAL CONSIDERATIONS

General	: Do not discharge into any place where its accumulation could be dangerous. Discharge to atmosphere in large quantities should be avoided. Contact supplier if guidance is required.
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14 TRANSPORT INFORMATION

UN No.	: 1845
Land transport	
H.I. nr : --	
Proper shipping name	: CARBON DIOXIDE, SOLID (DRY ICE)
HAZCHEM - Emergency Action Code	: HAZCHEM
HAZCHEM code	: 2T
- ADG Class	: 9
- ADG Classification code	: M11
- ADR Packing group	: III
Sea transport	
- IMO-IMDG code	: Class 9
- IMO Packing group	: III
- IMDG-Marine pollution	: -
- Emergency Schedule (EmS) - Fire	: F-C S-V
Air transport	
- ICAO-TI/IATA-DGR	: Packaging instructions cargo : 954 Packaging instructions passenger: 954
- Proper shipping name	: CARBON DIOXIDE, SOLID (DRY ICE)
• Class	: 9
Other transport 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. Before transporting product containers : - Ensure that containers are firmly secured. - Ensure there is adequate ventilation. - Compliance with applicable regulations.

15 REGULATORY INFORMATION

: Ensure all national regulations are observed
A chemical safety assessment does not need to be carried out for this product.

16 OTHER INFORMATION

Asphyxiant in high concentrations.
May cause frostbite.
Keep container in a well-ventilated place.
Do not breathe the gas.
The hazard of asphyxiation is often overlooked and must be stressed during operator training.

DISCLAIMER OF LIABILITY

: Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.
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.