

MATERIAL SAFETY DATA SHEET

Carbon Dioxide (Refrigerated Liquid)

PRODUCT AND COMPANY IDENTIFICATION

Product name	Carbon dioxide (refrigerated liquid)
Chemical name	Carbon dioxide
Chemical formula	CO ₂
Components	Formed from combination of two elements; carbon and oxygen
Impurities	Contains no other impurities which will influence the classification of the product
Company identification	CryoExpress Singapore Pte Ltd 1 Bukit Batok Crescent #05-15 WCEGA Plaza Singapore 658064
Telephone number	(65) 6561 5282

HAZARDS IDENTIFICATION

Hazards identification	Contact with product might cause frostbite. High concentration of CO ₂ might cause asphyxiation.
Inhalation	Asphyxiant. Symptoms include dizziness, headache, and unconsciousness. May also cause excitation, excess salivation, and rapid breathing. May cause stinging of the nose and throat.
Skin / Eye contact	Contact with rapidly expanding gases may cause frostbite.
Ingestion	Ingestion is unlikely to happen.

Product Information / Ingredients

Substance / Preparation	Substance
Components Impurities	Contain no other components or impurities, which will influence the classification of the product.
CAS No	124-38-

FIRST AID MEASURES

Inhalation	High concentration causes asphyxiation. Symptoms include loss of mobility and consciousness. Low concentration causes increased respiration and headache.
Skin/Eye contact	Flush eyes immediately and thoroughly with water. Spray with water for at least 15 minutes if frostbite occurs. Obtain medical assistance.
Ingestion	Ingestion is unlikely to happen.

FIRE FIGHTING MEASURES

Specific hazards	Non-flammable. Exposure to fire might cause containers to rupture or explode due to rapid increase of pressure.
Hazardous combustion products	None.
Suitable extinguishing media	All known extinguishers could be used.

ACCIDENTAL RELEASE MEASURES

Personal precautions	Evacuate all personnel from affected area. Wear protective clothing and self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation.
Environmental precautions	Stop flow if atmosphere is proved to be unsafe. Do not enter any place (e.g. basements, workpits) where its accumulation could be dangerous.
Clean up methods	Ventilate area.

HANDLING AND STORAGE

Handling and storage	Potential production of solid CO ₂ particles must be prevented. Suck back of water into container and backfeed must be prevented. Use only properly specified equipment, supply pressure and temperature for this product. Contact supplier if in doubt.
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EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limit value (PEL-OSHA)	5000 ppm.
Personal protection	Ensure adequate ventilation. Protect eye, face and skin from liquid splashes.

PHYSICAL AND CHEMICAL PROPERTIES

Molecular weight	44
Freezing point	-56.6 °C
Boiling point	-78.5 °C
Critical temperature	30 °C
Relative density, gas	1.52 (air = 1)
Relative density, liquid	1.03 (water = 1)
Vapour pressure 20 °C	57.3 bar
Solubility mg/l water	2000 mg/l
Odour and appearance	Colourless liquid which evaporates to colourless, odourless gas.
Other data	Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

STABILITY AND REACTIVITY

Stability and reactivity	Stable under normal conditions.
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TOXICOLOGICAL INFORMATION

General	High concentrations of CO ₂ cause rapid circulatory insufficiency. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness.
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ECOLOGICAL INFORMATION

General	When discharged in large quantities, it may contribute to greenhouse effect.
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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.

TRANSPORT INFORMATION

Proper shipping name Carbon dioxide, refrigerated liquid
UN Nr 2187
Hazard class 2.2
Shipping label Label 2: Non flammable liquid.
Other transport information Avoid transport on vehicles where load space is not separated from driver's compartment. Ensure vehicle driver is aware of the potential hazards and knows what to do in event of an accident or an emergency.

REGULATORY INFORMATION

General Proposed by the industry, not classified as dangerous substance
Risk and Safety Phrases RAs – Asphyxiant in high concentrations
S9 – Keep container in well ventilated place
S23– Do not breathe the Gas

OTHER INFORMATION

Ensure all national/local regulations are observed.
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