

SIG SOUTHERN INDUSTRIAL GAS SDN BHD

SAFETY DATA SHEET

LIQUID CARBON DIOXIDE

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name	Liquid Carbon Dioxide/ Carbon Dioxide Syphone Tube
Synonyms	Carbon dioxide (cryogenic liquid)
Chemical Formula	LCO ₂
CAS No	124-38-9
Use of Substance	Industrial use.
Manufacturer	SOUTHERN INDUSTRIAL GAS SDN. BHD. PLO 137, Kawasan Perindustrian Senai III, 81400 Senai, Johor.
Contact Number	07-598 3863
Emergency Phone Number (24 hr)	07-598 3863

2. HAZARDS IDENTIFICATION

Chemical Name	CAS No.	Classification Code	Labeling		
			H-code	Signal Word	Hazard Pictogram
Carbon dioxide	124-38-9	Press. Gas	H 281	Warning	

Classification of the substance	Press. Gas	: Gases under pressure (Refrigerated liquefied gas)
Hazard Statement	H 281	: Contains refrigerated gas; may cause cryogenic burns or injury.
Precautionary Statement	P 282	: Wear cold insulating gloves/ face shield/ eye protection.
	P 336	: Thaw frosted parts with lukewarm water. Do not rub affected area.
	P 315	: Get immediate medical advice/attention.

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P403 : Store in a well-ventilated place

Large volume increase on phase change – one volume of bulk liquid will instantly produce 250 volumes of gas plus a further 250 volumes once the solid has sublimed to gas under ambient conditions.

Other Hazards

Carbon dioxide is a powerful cerebral dilator. At concentrations 2% - 10% can cause nausea, dizziness, increase blood pressure and respiratory rate. Above 8% nausea and vomiting appear. Above 10%, suffocation and death can occur within minutes.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Common Name	Ingredient	CAS Number	% volume	OSHA-PEL
Liquid carbon dioxide	Carbon dioxide	124-38-9	Contains no other components or impurities which will influence the classification of the product.	5000 ppm

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

4. FIRST AID MEASURES

Eye Contact

Immediately flush eyes thoroughly for at least 15 minutes. Obtain medical assistance.

Inhalation

Low concentration of CO₂ cause increased respiration and headache.

In high concentration may cause asphyxiation.

Symptoms may include loss of mobility/ consciousness.

Victim may not be aware of asphyxiation.

Remove victim to uncontaminated area wearing self-contained breathing apparatus.

Keep victim warm and rested.

Obtain medical assistance.

Apply artificial respiration if breathing stopped.

Skin Contact

Remove contaminated clothing.

Treat for frostbite if necessary by gently warming affected areas.

Consult a physician.

Ingestion

None under normal use. Get medical attention if symptoms occur.

Most important symptoms and effects, both acute and delayed

Carbon dioxide gas is an asphyxiant with effects due to lack of oxygen.

5. FIRE FIGHTING MEASURES

Suitable extinguishing media	All known extinguishants can be used.
Unsuitable extinguishing media	None
Special hazards arising from the chemical	Exposure to fire may cause containers to rupture/ explode.
Special protective equipment and precautions for fire fighters	Use self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Evacuate area. Ensure adequate air ventilation. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Use protective clothing.
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	Provide adequate ventilation.

7. HANDLING AND STORAGE

Precaution for safe handling	Never allow any unprotected part of the body to touch uninsulated pipes or vessels that contain cold fluids. The extremely cold metal of the container will cause moist flesh to stick fast and tear when one attempts to withdraw from it. Check all hoses and equipment before filling them with the liquid. A leak of liquid carbon dioxide will result in the formation of “dry ice” particles which will be forcibly ejected from the system, possibly injuring the operator. A complete hose failure can result in a large release of carbon dioxide and violent movement of the hose and associated equipment, which may cause severe injury or death. Special care must be taken when depressurizing and disconnecting hoses. Contact your gas supplier if in doubt. Do not allow back feed into the container. Suck back of water into the container must be prevented.
Condition for safe storage	Keep away from ignition sources (including static discharges). Keep container below 50°C in a well-ventilated place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters	Exposure Limit – OSHA-PEL Time Weighted Average (TWA): 5000 ppm ; 9000 mg/m ³
Appropriate engineering controls	Ensure adequate air ventilation. Use a local exhaust system, if necessary, to keep the concentration of carbon dioxide below all applicable exposure limits in the worker's breathing zone Under general ventilation may be acceptable to keep carbon dioxide below the exposure limit.
Personal protection equipment	Protective clothing is only intended to protect the wearer handling cold equipment or from accidental contact with cold gas or solid carbon dioxide. Non-absorbent insulated gloves, goggles or a facemask should be worn to protect otherwise unprotected parts of the skin.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colorless, liquid
Odour	No odour warning properties
Odour threshold	No information available
pH	3.7 (for carbonic acid)
Melting point / Freezing point	-56.6 °C
Boiling point	Sublimes. (-78.5 °C)
Flash point	Not applicable
Evaporation rate	High
Flammability	Non flammable
Upper/lower explosive limit	Not applicable
Vapour pressure	57.3 bar (20°C)
Vapour density (Air =1)	1.52
Relative density	1.03 (water = 1) ; 1.52 (air = 1)
Solubility	2000 mg/L
Partition coefficient	Not available
Auto ignition temperature	Not applicable
Decomposition temperature	None
Viscosity	(Kinematic viscosity at 20°C) 0.091 x 10 ⁻⁶ m ² /s

10. STABILITY AND REACTIVITY

Reactivity	No reactivity hazard other than the effects described in sub-section below
Chemical Stability	Stable under normal conditions of use and storage.
Possibility of hazardous reactions	None
Condition to avoid	Contact with incompatible materials. Exposure to electrical discharges, and/or high temperatures as stated below.
Incompatible materials	Alkali metals. Chromium. Metal acetylides. Alkaline earth metals. Titanium above 550 °C Magnesium above 775 °C Uranium above 750 °C
Hazardous decomposition products	An electrical discharge and high temperatures can cause carbon dioxide to decompose into carbon monoxide and oxygen. Carbon dioxide will combine with water vapor or liquid to form carbonic acid.

11. TOXICOLOGICAL INFORMATION**Information on toxicological effects**

Acute toxicity	Oral: LD ₅₀ > No information available. Dermal: LD ₅₀ > No information available. Inhalation: LC ₅₀ > No information available. Inhalation: No data is available on the product itself
Skin corrosion / irritation	Based on available data, the classification criteria are not met.
Serious eye damage/ irritation	Based on available data, the classification criteria are not met.
Respiratory or skin sensitisation	Based on available data, the classification criteria are not met.
Germ cell mutagenicity	Based on available data, the classification criteria are not met.
Carcinogenicity product	Based on available data, the classification criteria are not met.

Reproductive toxicity product	Based on available data, the classification criteria are not met.
Specific target organ toxicity – single exposure product.	Based on available data, the classification criteria are not met.
Specific target organ toxicity – repeated exposure product	Based on available data, the classification criteria are not met.
Aspiration hazard product	Not applicable to gases and gas mixtures.

12. ECOLOGICAL INFORMATION

Ecotoxicity effect	
Acute toxicity product	No ecological damage caused by this product
Additional ecological information	No ecological damage caused by this product
Persistence and degradability	Not applicable to gases and gas mixtures.
Bioaccumulative potential	The product is expected to biodegrade and is not expected to persist for long periods in an aquatic environment.
Mobility in soil	Unlikely to cause ground or water pollution due to its high volatility.
Other adverse effects	Global warming potential : Contains Greenhouse Gas(es). When discharged in large quantities may contribute to green house effect. Global Warming Potential : 1

13. DISPOSAL CONSIDERATIONS

Waste from residue / unused product	Do not discharge into any place where its accumulation could be dangerous. Vent to atmosphere in a well-ventilated place. Discharge to atmosphere in large quantities should be avoided.
Contaminated packaging	Do not reuse empty containers. Empty remaining contents. Dispose of container and unused contents in accordance with local and national regulation. Return cylinder to supplier

14. TRANSPORT INFORMATION

UN Number	UN 2187
UN proper shipping name	Carbon Dioxide, Refrigerated Liquid
Transport hazard class(es)	2.2
Packing group	-
Environmental hazards	Not applicable
Special precautions for user	-
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable
Information	Ensure the driver is understand well on the potential hazards of the load and knows what to do in the event of an accident or an emergency. Secured the product containers before transporting it. Ensure that the cylinder valve is closed and not leaking. Container valve guards or caps should be in place. Ensure adequate air ventilation.

15. REGULATORY INFORMATION

Contact local government authority.

16. OTHER INFORMATION

Date of Preparation / Revision of SDS 2-October-2014 / Rev. 01

Legend to the abbreviations and acronyms used

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Abbreviations	LC ₅₀	: median lethal concentration
	LD ₅₀	: median lethal dose
	PEL	: Permissible exposure limits

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