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MATERIAL SAFETY DATA SHEET

Product Name:

CARBON DIOXIDE,
Solid (CO_2)

Issued: May 2014 **Revision: 7**

Label 2.2 : Non flammable, non toxic gas.

IDENTIFICATION

Chemical Name: Carbon Dioxide, Solid
Synonyms: Dry Ice
UN Number: 1845
Poisons Schedule Number: None allocated
G.T. EPG. (Group Text. Emergency Procedure Guide): AS 1678 9B7

Use: Food Freezing Refrigerated Transport.

HAZARDS IDENTIFICATION

Dangerous Goods Class and Subsidiary Risk: 2.2

HSNO Classification: Not Hazardous

Hazard Statement: Refrigerated solidified gas. Contact with product may cause cold burns or frostbite.
In high concentrations may cause asphyxiation.

Precautionary Statements: Read label before use.
Read Material Safety Data Sheets.
Wear cold insulating gloves/face shield/eye protection.
Thaw frosted parts with lukewarm water. Do not rub affected area.
Get immediate medical advice/attention.
Store in a well ventilated place.

COMPOSITION

Ingredients

Chemical Entity	CAS Number	Proportion
Carbon Dioxide	124-38-9	99.8%

FIRST AID MEASURES

Health Effects

Acute
Swallowed: Can cause frost burn if swallowed.
Eye: Can cause severe frostburn if brought in contact with eye.
Skin: Can cause severe frostburn if brought in contact with skin.

Inhaled: Carbon Dioxide is non-toxic at normal temperature and pressure. By diluting the oxygen concentration in air below the level necessary to support life, it can act as an asphyxiant. Effects of oxygen deficiency are: 12-16%: breathing and pulse rate increased, muscular coordination slightly disturbed; 10-14%: emotional upset, abnormal fatigue, disturbed respiration; 6-10%: nausea and vomiting, collapse or loss of consciousness; below 6%: convulsive movements, possible respiratory collapse and death.

Chronic
Long term exposure to carbon dioxide has no known health effects. Prolonged exposure to an oxygen deficient atmosphere (below 18% oxygen in air) may affect the heart and nervous system.

First Aid
Inhalation:
Call doctor. Prompt medical attention is mandatory in all cases of overexposure to Carbon Dioxide. If victim conscious: Move to uncontaminated area to breathe fresh air. Keep warm and quiet. If victim is unconscious: Move to uncontaminated area and give assisted respiration. When normal breathing is restored, treatment as above. Continued treatment should be symptomatic and supportive.

Eye Contact
Immediately flush eyes thoroughly with tepid water for at least 15 minutes. Apply light weight eye pad. Obtain medical assistance.

Skin Contact
Liquid Carbon Dioxide can cause severe frostburn upon contact with skin. In case of frostburn flush with tepid water for at least 15 minutes. Apply sterile dressing. Obtain medical assistance.

Advice to Doctor
Advise doctor that victim is experiencing (has experienced) hyperoxia. Specialist advice for treatment of cryogenic burns is available at a Burns Unit.

General:
Low air temperature due to close proximity of liquefied atmosphere gases can cause hypothermia and all persons at risk should be warmly clad. Avoid liquid spillage as cryogenic liquids embrittle many materials on contact.

FIRE FIGHTING MEASURES

Flammability:
Non Flammable.

Fire/Explosion Hazard:
Carbon Dioxide is non-flammable, but container may release large quantities of Carbon Dioxide if ruptured. Carbon Dioxide may serve to extinguish fire.

Extinguishing Media:
Water fog or fine water spray. If possible, stop flow of product. Move away from the container and cool with water from a protected position. If leaking do not spray water onto container. Water surrounding area (from protected position) to contain fire. Persons in the immediate area of the incident should be evacuated.

Hazchem Code:
2T

Recommended Protective Clothing:
A full chemical protection suit and breathing apparatus should be worn.

ACCIDENTAL RELEASE MEASURES

Personal Protection:
Personnel handling liquid carbon dioxide must be provided with safety footwear and leather or PVC gloves. Full cover overalls and safety glasses recommended. In areas where equipment failure may cause an immediate high concentration of carbon dioxide, approved self-contained full face respiratory equipment should be readily available.

Spills and Disposal:
Stop leak if it can be done without risk. Allow gas to dissipate to atmosphere. Ventilate area. Cold vapours are heavier than air. In case of large spillage evacuate nearby trenches, excavations, pits and the like.

Reference Guide:
Standard SNZ HB 76:2008 Dangerous Goods – Initial Emergency Response Guide.

General:
Low air temperature due to close proximity of liquefied atmosphere gases can cause hypothermia and all persons at risk should be warmly clad. Avoid liquid spillage as cryogenic liquids embrittle many materials on contact.

HANDLING AND STORAGE

Handling

Flammability:
Non Flammable.

General:
Low air temperature due to close proximity of liquefied atmosphere gases can cause hypothermia and all persons at risk should be warmly clad. Avoid liquid spillage as cryogenic liquids embrittle many materials on contact.

Approved Handlers:
Approved handlers are not required, non hazardous gas (HSNO).

Storage

Separation:
Supplied in portable cryogenic liquid containers or by bulk road tanker to cryogenic storage vessels installed at users' premises.

Spills and Disposal:
Stop leak if it can be done without risk. Allow gas to dissipate to atmosphere. Ventilate area. Cold vapours are heavier than air. In case of large spillage evacuate nearby trenches, excavations, pits and the like.

EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Standards:
TLV 5,000 ppm v/v STEL 30,000 ppm v/v

Engineering Controls:
Provide adequate local exhaust and dilution (general) ventilation and supply sufficient replacement air to maintain oxygen concentration above 18%.

Personal Protection:
Personnel handling solid dioxide must be provided with safety footwear and leather or PVC gloves. Full cover overalls and safety glasses recommended. In areas where equipment failure may cause an immediate high concentration of carbon dioxide, approved self-contained full face respiratory equipment should be readily available.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Properties

Appearance:	Frosty white, solid, sharp odour	Flashpoint:	Non Flammable
Sublimation Temp:	-78.5°C	Flammability Limits:	Non Flammable
Solubility in Water (at 0°C):	1.716 m^3/kg		

Other Properties

Relative Density (at 15°C) (Air = 1):	1.53	Density of Gas (101.3 kPa, 15°C):	1.873 kg/m^3
Molecular Weight:	44.01	Critical Temperature:	31.06°C

STABILITY AND REACTIVITY

Flammability:
Non Flammable. Contains refrigerated gas; may cause cryogenic burns or injury

Materials Compatibility:
Stable under normal conditions. Liquid spillages can cause embrittlement of structural materials.

TOXICOLOGY INFORMATION

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

ECOLOGICAL INFORMATION

Can cause frost damage to vegetation.
When discharged in large quantities may contribute to the greenhouse effect.
Global warming factor (CO_2=1): 1

DISPOSAL CONSIDERATIONS

Do not discharge into any place where its accumulation could be dangerous

TRANSPORT INFORMATION

UN Number: 1845
Proper Shipping Name: CARBON DIOXIDE, SOLID (DRY ICE)
Dangerous Goods Class and Subsidiary Risk: 2.2
Packing Group: Not applicable
Hazchem Code: 2T
Other Information: Avoid transport on vehicles where the load 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 cylinder valve is closed and not leaking.
- Ensure there is adequate ventilation.
- Compliance with applicable regulations.

REGULATORY INFORMATION

ERMA Register Approval No: HSR001018

HSNO Controls: Hazardous Substances (Compressed Gases) Regulations 2004.
Hazardous Substances (Tank Wagon and Transportable Containers) Regulations 2004.

Approved Handlers:
Approved handlers are not required, non hazardous gas (HSNO).

OTHER INFORMATION

Portable liquid vessels - Colour Metallic silver
Outlet Liquid - CGA 320
Gas - AS2743 Type 30

References:
- L'Air Liquide Gas Encyclopaedia - Elsevier Scientific Publishing Co. Amsterdam
- Cheminfo Database
- New Zealand Code for the Transport of Dangerous Goods by Road and Rail
- NHMRC Threshold Limit Values - Commonwealth Dept Health
- SAA Safe Storage and Handling Information Cards
- SAA Emergency Procedure Cards
- Matheson Gas Data Book, 6th Edition, Matheson 1980
- Canadian Liquid Air Montreal, Canada - Gas Products Safety Data Sheets
- AS 1894 Code of Practice for Safe Handling of Cryogenic fluids
- NZCIC Code of Practice – Preparation of Safety Data Sheets

END MSDS

This MSDS summarises our best knowledge of the health and safety hazard information of the product and how to safely handle and use the product in the workplace. Each user should read this MSDS and consider the information in the context of how the product will be handled and used in the workplace in conjunction with other products.

If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact this company.

Our responsibility for products sold is subject to our standard terms and conditions, a copy of which is sent to our customers and is also available on request.

This MSDS has been prepared in accordance with NZCIC Code of Practice – Preparation of Safety Data Sheets

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