

**SAFETY DATA SHEET**

# 033

**1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER****1.1 Product identifier****Product name** SOLID CARBON DIOXIDE**Synonym(s)** 033 - MSDS NUMBER • BOC SOLID CARBON DIOXIDE • DRY ICE • PRODUCT CODES: 088, 089, 099, 0297, 0298**1.2 Uses and uses advised against****Use(s)** FREEZING APPLICATIONS • MEDICAL APPLICATIONS • SCIENTIFIC APPLICATIONS • SPECIAL EFFECTS APPLICATIONS**1.3 Details of the supplier of the product****Supplier name** BOC LIMITED (AUSTRALIA)**Address** 10 Julius Avenue, North Ryde, NSW, 2113, AUSTRALIA**Telephone** 131 262, (02) 8874 4400**Fax** 132 427 (24 hours)**Website** <http://www.boc.com.au>**1.4 Emergency telephone number(s)****Emergency** 1800 653 572 (24/7) (Australia only)**2. HAZARDS IDENTIFICATION****2.1 Classification of the substance or mixture**

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

**2.2 Label elements**

No signal word, pictograms, hazard or precautionary statements have been allocated.

**2.3 Other hazards**

Refrigerated solidified gas, exists at -78.5 °C. Contact with product may cause severe cold burns or frostbite. Asphyxiation hazard.

**3. COMPOSITION/ INFORMATION ON INGREDIENTS****3.1 Substances / Mixtures**

Ingredient	CAS Number	EC Number	Content
CARBON DIOXIDE	124-38-9	204-696-9	99.9%

**4. FIRST AID MEASURES****4.1 Description of first aid measures**

**Eye** Cold burns: Immediately flush with tepid water or with sterile saline solution. Hold eyelids apart and irrigate for 15 minutes. Seek medical attention.

**Inhalation** If inhaled, remove from contaminated area. To protect rescuer, use an Air-line respirator or Self Contained Breathing Apparatus (SCBA). Apply artificial respiration if not breathing. Give oxygen if available. For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor.

**Skin** Cold burns: Remove contaminated clothing and gently flush affected areas with warm water (30°C) for 15 minutes. Apply sterile dressing and treat as for a thermal burn. For large burns, immerse in warm water for 15 minutes. DO NOT apply any form of direct heat. Seek immediate medical attention.

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**Ingestion** Due to product form and application, ingestion is considered unlikely.

**First aid facilities** No information provided.

## **4.2 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 CO<sub>2</sub> cause increased respiration and headache.

## **4.3 Immediate medical attention and special treatment needed**

Treat for asphyxia and cold burns.

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## **5. FIRE FIGHTING MEASURES**

### **5.1 Extinguishing media**

Use an extinguishing agent suitable for the surrounding fire.

### **5.2 Special hazards arising from the substance or mixture**

Non flammable.

### **5.3 Advice for firefighters**

No fire or explosion hazard exists.

### **5.4 Hazchem code**

1R

1 Coarse Water Spray.

R Wear liquid-tight chemical protective clothing and breathing apparatus. Dilute spill and run-off.

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## **6. ACCIDENTAL RELEASE MEASURES**

### **6.1 Personal precautions, protective equipment and emergency procedures**

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. Use protective clothing.

### **6.2 Environmental precautions**

Try to stop release. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

### **6.3 Methods of cleaning up**

Ventilate area. Release to atmosphere will generate vapour fog clouds which can travel considerable distances and affect visibility. These clouds should be treated as asphyxiating atmospheres as the evaporated liquid will have displaced air. Refer to vessel operating instructions. In an emergency allow liquid and gas to escape to atmosphere. Monitor oxygen concentration in confined spaces.

### **6.4 Reference to other sections**

See Sections 8 and 13 for exposure controls and disposal.

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## **7. HANDLING AND STORAGE**

### **7.1 Precautions for safe handling**

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

### **7.2 Conditions for safe storage, including any incompatibilities**

Store in a cool, dry, well ventilated area on a solid surface. Do not store in a glass or sealed container as this can result in rupture or explosion of the container from over-pressurisation. Storage in an insulated container will slow the sublimation process.

### **7.3 Specific end use(s)**

No information provided.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### 8.1 Control parameters

#### Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>
Carbon dioxide	SWA (AUS)	5000	9000	30000	54000
Carbon dioxide in coal mines	SWA (AUS)	12500	22500	30000	54000

#### Biological limits

No biological limit values have been entered for this product.

### 8.2 Exposure controls

**Engineering controls** Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, use local or extraction ventilation at source.

#### PPE

<b>Eye / Face</b>	Wear safety glasses.
<b>Hands</b>	Wear leather gloves.
<b>Body</b>	Wear safety boots.
<b>Respiratory</b>	Where an inhalation risk exists, wear Self Contained Breathing Apparatus (SCBA) or an Air-line respirator.



## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

<b>Appearance</b>	WHITE FROSTY SOLID
<b>Odour</b>	ODOURLESS
<b>Flammability</b>	NON FLAMMABLE
<b>Flash point</b>	NOT RELEVANT
<b>Boiling point</b>	-78.5°C
<b>Melting point</b>	-56.6°C
<b>Evaporation rate</b>	NOT APPLICABLE
<b>pH</b>	NOT APPLICABLE
<b>Vapour density</b>	1.52 (Air = 1)
<b>Specific gravity</b>	NOT APPLICABLE
<b>Solubility (water)</b>	0.759 gas cm <sup>3</sup> /cm <sup>3</sup>
<b>Vapour pressure</b>	57.3 bar @ 20°C
<b>Upper explosion limit</b>	NOT RELEVANT
<b>Lower explosion limit</b>	NOT RELEVANT
<b>Partition coefficient</b>	0.83 log Pow (n-Octanol/Water)
<b>Autoignition temperature</b>	NOT AVAILABLE
<b>Decomposition temperature</b>	NOT AVAILABLE
<b>Viscosity</b>	NOT AVAILABLE
<b>Explosive properties</b>	NOT AVAILABLE
<b>Oxidising properties</b>	NOT AVAILABLE
<b>Odour threshold</b>	NOT AVAILABLE

### 9.2 Other information

<b>Critical temperature</b>	31°C
<b>% Volatiles</b>	100 %

## 10. STABILITY AND REACTIVITY

### 10.1 Reactivity

Unreactive under normal conditions.

**10.2 Chemical stability**

Stable under recommended conditions of storage.

**10.3 Possibility of hazardous reactions**

Polymerization will not occur.

**10.4 Conditions to avoid**

Avoid moisture.

**10.5 Incompatible materials**

Low temperature of product will change mechanical properties of some materials. Corrosive when moist.

**10.6 Hazardous decomposition products**

This material will not decompose to form hazardous products other than that already present.

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## **11. TOXICOLOGICAL INFORMATION**

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**11.1 Information on toxicological effects**

<b>Acute toxicity</b>	Based on available data, the classification criteria are not met.
<b>Skin</b>	Not classified as a skin irritant. Contact with dry ice powder may cause frostbite injury or cold burns.
<b>Eye</b>	Not classified as irritating to the eyes. Contact with dry ice powder may cause frostbite injury or cold burns.
<b>Sensitization</b>	Not classified as causing skin or respiratory sensitisation.
<b>Mutagenicity</b>	Not classified as a mutagen.
<b>Carcinogenicity</b>	Not classified as a carcinogen.
<b>Reproductive</b>	Not classified as a reproductive toxin.
<b>STOT – single exposure</b>	Evaporates to form an asphyxiant gas. Effects are proportional to oxygen displacement. Over exposure may result in dizziness, drowsiness, weakness, fatigue, breathing difficulties and unconsciousness. Carbon dioxide in low concentrations can cause increased respiration and headache.
<b>STOT – repeated exposure</b>	Not classified as causing organ effects from repeated exposure.
<b>Aspiration</b>	Not classified as causing aspiration.

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## **12. ECOLOGICAL INFORMATION**

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**12.1 Toxicity**

No information provided.

**12.2 Persistence and degradability**

No information provided.

**12.3 Bioaccumulative potential**

No information provided.

**12.4 Mobility in soil**

No information provided.

**12.5 Other adverse effects**

When discharged to the atmosphere, carbon dioxide may contribute to the greenhouse effect.

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## **13. DISPOSAL CONSIDERATIONS**

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**13.1 Waste treatment methods**

<b>Waste disposal</b>	Allow product to sublime to the atmosphere in a well ventilated area where no build-up of carbon dioxide vapour can occur. Take measures to ensure no-one comes into contact with the product during this process.
<b>Legislation</b>	Dispose of in accordance with relevant local legislation.

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## **14. TRANSPORT INFORMATION**

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**CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE**



	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
<b>14.1 UN Number</b>	1845	1845	1845
<b>14.2 Proper Shipping Name</b>	CARBON DIOXIDE, SOLID (DRY ICE)	CARBON DIOXIDE, SOLID (DRY ICE)	CARBON DIOXIDE, SOLID (DRY ICE)
<b>14.3 Transport hazard class</b>	9	9	9
<b>14.4 Packing Group</b>	III	III	III

**14.5 Environmental hazards** Not a Marine Pollutant

**14.6 Special precautions for user**

**Hazchem code** 1R

**GTEPG** 9B7

**EMS** F-C, S-V

**Other information** Transport on open top vehicles in accordance with Australian Code for the Transport of Dangerous Goods.

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## 15. REGULATORY INFORMATION

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

<b>Poison schedule</b>	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).
<b>Classifications</b>	Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.  The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].
<b>Hazard codes</b>	None allocated.
<b>Risk phrases</b>	None allocated.
<b>Safety phrases</b>	None allocated.
<b>Inventory listing(s)</b>	<b>AUSTRALIA: AICS (Australian Inventory of Chemical Substances)</b> All components are listed on AICS, or are exempt.

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## 16. OTHER INFORMATION

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<b>Additional information</b>	The storage of significant quantities of gas cylinders must comply with AS4332 The storage and handling of gases in cylinders.  Application method: Manual handle with personal protective equipment.
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**PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:**

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

**HEALTH EFFECTS FROM EXPOSURE:**

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

**Abbreviations**

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m <sup>3</sup>	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

**Revision history**

Revision	Description
3.2	Standard SDS Review
3.1	Standard SDS Review
3.0	Converted to GHS.
2.1	Standard SDS Review.
2.0	Standard SDS Review.
1.0	Initial SDS creation

**Report status**

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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