

Carbon Dioxide

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## SAFETY DATA SHEET

### SECTION 1. IDENTIFICATION

Product identifier used on the label

: **Carbon Dioxide**

Other means of identification : InnoPure Carbon Dioxide,  
InnoCarb Carbon Dioxide  
InnoSpec PurityPlus Carbon Dioxide 4.0  
InnoBeam PurityPlus Carbon Dioxide 4.5

Recommended use of the chemical and restrictions on use

: Industrial use; Medical applications; Food applications.  
Recommended restrictions: None Known.

Chemical family

: gas

Name, address, and telephone number  
of the supplier:

**Innovair Industrial Limited**

150 McPhillips Street  
Winnipeg, MB, Canada  
R3E 2J9

Supplier's Telephone # : 800-667-3344

24 Hr. Emergency Tel # : No information available.

Name, address, and telephone number of  
the manufacturer:

Refer to supplier

### SECTION 2. HAZARDS IDENTIFICATION

Classification of the chemical

Colourless gas. Odourless.

This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015).

Hazard classification :

Gases under pressure -Liquefied gas  
Simple asphyxiant

Label elements

Hazard pictogram(s)



Signal Word

WARNING!

Hazard statement(s)

Contains gas under pressure; may explode if heated.  
May displace oxygen and cause rapid suffocation

Precautionary statement(s)

Protect from sunlight and store in well-ventilated place.

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### Other hazards

None known.

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance

<u>Chemical name</u>	<u>Common name and synonyms</u>	<u>CAS #</u>	<u>Concentration (% by weight)</u>
Carbon dioxide	Carbonic anhydride CO <sub>2</sub>	124-38-9	100.00

### SECTION 4. FIRST-AID MEASURES

#### Description of first aid measures

- Ingestion* : Not an expected route of entry.
- Inhalation* : Immediately remove person to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen by qualified medical personnel only. Get medical attention if irritation develops and persists.
- Skin contact* : Not an expected route of entry.
- Eye contact* : Not an expected route of entry.

#### Most important symptoms and effects, both acute and delayed

- : Simple asphyxiant - this product does not contain oxygen and may cause asphyxia in confined spaces. Oxygen content in the area must not fall below 19.5% or harmful effects will result. In extremely high concentrations, product may act as an asphyxiant and cause increased breathing and pulse rates, fatigue and unconsciousness. As asphyxiation progresses, nausea, vomiting, prostration and loss of consciousness may result, eventually leading to convulsions, coma and death.

#### Indication of any immediate medical attention and special treatment needed

- : Provide general supportive measures and treat symptomatically.

### SECTION 5. FIRE-FIGHTING MEASURES

#### Extinguishing media

- Suitable extinguishing media* : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

#### *Unsuitable extinguishing media*

- : None known.

#### Special hazards arising from the substance or mixture / Conditions of flammability

- : Not flammable under normal conditions of use. Closed containers are contained under pressure and may explode if exposed to excess heat for a prolonged period of time. Product is a simple asphyxiant. Asphyxiant, can replace oxygen in confined area. May displace oxygen in breathing air and lead to suffocation and death, particularly in confined spaces.

#### Flammability classification (OSHA 29 CFR 1910.106)

- : Non-flammable.

#### Hazardous combustion products

- : Oxygen; Carbon monoxide

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**SAFETY DATA SHEET****Special protective equipment and precautions for firefighters***Protective equipment for fire-fighters*

- : Firefighters should wear proper protective equipment and self-contained breathing apparatus (SCBA) with full face piece operated in positive pressure mode. Do not enter without wearing specialized protective equipment suitable for the situation. Firefighter's normal protective clothing (Bunker Gear) will not provide adequate protection. A full-body encapsulating chemical protective suit with positive pressure self-contained breathing apparatus (NIOSH approved or equivalent) may be necessary.

*Special fire-fighting procedures*

- : Evacuate personnel to safe areas. Avoid inhaling gas. If feasible, stop the flow of gas. Move containers from fire area if safe to do so. Shield personnel to protect from venting or rupturing containers. Cool closed containers exposed to fire with water spray. Stay away from ends of cylinders and withdraw immediately in case of rising sounds or discolouration of containers.

**SECTION 6. ACCIDENTAL RELEASE MEASURES****Personal precautions, protective equipment and emergency procedures**

- : Restrict access to area until completion of clean-up. Keep all other personnel upwind and away from the spill/release. Ensure clean-up is conducted by trained personnel only. All persons dealing with clean-up should wear the appropriate protective equipment including self-contained breathing apparatus. Refer to Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION, for additional information on acceptable personal protective equipment.

**Environmental precautions** : Ensure spilled product does not enter confined areas.**Methods and material for containment and cleaning up**

- : Ventilate area of release. Do not enter confined spaces unless adequately ventilated. Eliminate all ignition sources. Leaks in lines to equipment set-ups can be identified by painting suspected sites with soapy water. Leaks can be located by bubble formation. Stop spill or leak at source if safely possible. If leak cannot be stopped, move cylinders to an open space. Isolate the area until all gas has dispersed. Notify the appropriate authorities as required.

**Special spill response procedures**

- : If a spill/release in excess of the EPA reportable quantity is made into the environment, immediately notify the National Response Center in the United States (phone: 1-800-424-8802).  
US CERCLA Reportable quantity (RQ): None reported.

In Canada: Contact appropriate local and provincial environmental authorities for assistance and/or reporting requirements.

**SECTION 7. HANDLING AND STORAGE****Precautions for safe handling**

- : Do not handle until all safety precautions have been read and understood. Before handling, it is very important that engineering controls are operating, and that protective equipment requirements and personal hygiene measures are being followed. People working with this chemical should be properly trained regarding its hazards and its safe use. Simple asphyxiant - this product does not contain oxygen and may cause asphyxia in confined spaces. Oxygen content in the area must not fall below 19.5% or harmful effects will result.  
Use only in well-ventilated areas. Avoid inhaling gas. Keep away from extreme heat and flame. Keep away from incompatibles. Protect cylinders from damage. Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point. Never attempt to lift cylinder by its cap. Open valves slowly to prevent rapid decompression. Shut flow off at cylinder valve and not just at the regulator after use. Do not puncture or incinerate containers.

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- Conditions for safe storage** : Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Store in a cool, dry, well ventilated area, away from heat and ignition sources. Avoid storage of cylinders for more than six months. Do not store in direct sunlight. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks.
- Incompatible materials** : Reactive metals; Metal hydrides

### SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

<u>Exposure Limits:</u>	<u>ACGIH TLV</u>		<u>OSHA PEL</u>	
	<u>TWA</u>	<u>STEL</u>	<u>PEL</u>	<u>STEL</u>
	Carbon dioxide	5000 ppm	30 000 ppm	5000 ppm (9000 mg/m <sup>3</sup> )

#### Exposure controls

##### **Ventilation and engineering measures**

- : Provide exhaust ventilation or other engineering controls to keep the airborne concentration of vapours below their respective threshold limit value. Recommended monitoring procedures: Provide sufficient air exchange and/or exhaust in work rooms. Oxygen content in the area must not fall below 19.5% or harmful effects will result.

##### **Respiratory protection**

- : If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable approved respiratory protection. Confirmation of which type of respirator is most suitable for the intended application should be obtained from respiratory protection suppliers.

##### **Skin protection**

- : Wear protective gloves/clothing. Wear work gloves and safety shoes when handling cylinders.

##### **Eye / face protection**

- : Safety glasses with side-shields or chemical splash goggles, depending on workplace standards.

##### **Other protective equipment**

- : An eyewash station and safety shower should be made available in the immediate working area. Other equipment may be required depending on workplace standards.

##### **General hygiene considerations**

- : Avoid inhaling gas. Do not eat, drink or smoke when using this product. Handle in accordance with good industrial hygiene and safety practice.

### SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance** : Colourless gas.  
**Odour** : Odourless.  
**Odour threshold** : Not applicable.  
**pH** : Not applicable.  
**Melting Point/Freezing point** : Not available.

#### **Initial boiling point and boiling range**

- : - 78.5°C

- Flash point** : Non-flammable.  
**Flashpoint (Method)** : Not applicable.  
**Evaporation rate (BuAe = 1)** : Not applicable.  
**Flammability (solid, gas)** : Not flammable.  
**Lower flammable limit (% by vol.)** : Not applicable.

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**SAFETY DATA SHEET****Upper flammable limit (% by vol.)**

: Not applicable.

**Oxidizing properties**

: None known.

**Explosive properties**

: Not explosive.

**Vapour pressure**

: 5730 kPa

**Vapour density**

: (Air = 1) 1.522

**Relative density / Specific gravity**

: 0.82

**Solubility in water**

: Completely soluble.

**Other solubility(ies)**

: Not available.

**Partition coefficient: n-octanol/water or Coefficient of water/oil distribution**

: Log P(oct) = 0.92

**Auto-ignition temperature**

: Not applicable.

**Decomposition temperature**

: Not applicable.

**Viscosity**

: Not applicable.

**Volatiles (% by weight)**

: Not applicable.

**Volatile organic Compounds (VOC's)**

: Not applicable.

**Absolute pressure of container**

: Not available.

**Flame projection length**

: Not applicable.

**Other physical/chemical comments**: Molecular Weight: 44.1 g/mol  
Molecular formula:CO<sub>2</sub>  
Critical temperature:31.1°C**SECTION 10. STABILITY AND REACTIVITY****Reactivity**

: Not normally reactive.

**Chemical stability**

: Stable under normal conditions.

**Possibility of hazardous reactions**

: No dangerous reaction known under conditions of normal use. Hazardous polymerization does not occur.

**Conditions to avoid**

: Avoid contact with incompatible materials. Ensure adequate ventilation, especially in confined areas.

**Incompatible materials**

: See Section 7 (Handling and Storage) for further details.

**Hazardous decomposition products**

: None known, refer to hazardous combustion products in Section 5.

**SECTION 11. TOXICOLOGICAL INFORMATION****Information on likely routes of exposure:****Routes of entry inhalation** : YES**Routes of entry skin & eye** : NO**Routes of entry Ingestion** : NO**Routes of exposure skin absorption**

: NO

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### Potential Health Effects:

#### Signs and symptoms of short-term (acute) exposure

##### *Sign and symptoms Inhalation*

- : Simple asphyxiant - this product does not contain oxygen and may cause asphyxia in confined spaces. Oxygen content in the area must not fall below 19.5% or harmful effects will result.

In extremely high concentrations, product may act as an asphyxiant and cause increased breathing and pulse rates, fatigue and unconsciousness. As asphyxiation progresses, nausea, vomiting, prostration and loss of consciousness may result, eventually leading to convulsions, coma and death.

##### *Sign and symptoms ingestion*

- : Not an expected route of entry under normal conditions of use. (gas)

##### *Sign and symptoms skin*

- : Not an irritant. Contact with liquid or refrigerated gas can cause cold burns and frostbite. Symptoms of frostbite may include numbness, prickling and itching. Symptoms of more severe frostbite include a burning sensation, stiffness of the affected area, blistering, tissue death and gangrene.

##### *Sign and symptoms eyes*

- : Not an irritant. Contact with liquid may cause frostbite. Symptoms of frostbite may include numbness, prickling and itching.

#### Potential Chronic Health Effects

- : None reported.

#### Mutagenicity

- : Not expected to be mutagenic in humans.

#### Carcinogenicity

- : No components are listed as carcinogens by ACGIH, IARC, OSHA or NTP.

#### Reproductive effects & Teratogenicity

- : Not expected to have other reproductive effects.

#### Sensitization to material

- : Not expected to be a skin or respiratory sensitizer.

#### Specific target organ effects

- : The substance or mixture is not classified as specific target organ toxicant, single exposure.

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

#### Medical conditions aggravated by overexposure

- : Pre-existing skin, eye and respiratory disorders.

#### Synergistic materials

- : No information available.

#### Toxicological data

- : Not classified for acute toxicity based on available data. See below for toxicological data on the substance.

<u>Chemical name</u>	<u>LC<sub>50</sub>(4hr)</u> <u>inh, rat</u>	<u>LD<sub>50</sub></u>	
		<u>(Oral, rat)</u>	<u>(Rabbit, dermal)</u>
Carbon dioxide	200 000 ppm/2H (141 421 ppm/4H)	N/Ap(gas)	N/Ap(gas)

#### Other important toxicological hazards

- : None known.

### SECTION 12. ECOLOGICAL INFORMATION

#### Ecotoxicity

- : No information available. Measured ecotoxicity data are not available for the aquatic toxicity endpoints for these gases. These chemicals are gases at standard temperature and pressure and are expected to partition primarily to air, therefore aquatic toxicity tests may not be relevant.

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**Ecotoxicity data:**

<u>Ingredients</u>	CAS #	Toxicity to Fish		
		LC50 / 96h	NOEC / 21 day	M Factor
Carbon dioxide	124-38-9	N/Ap	N/Ap	N/Ap

<u>Ingredients</u>	CAS #	Toxicity to Daphnia		
		EC50 / 48h	NOEC / 21 day	M Factor
Carbon dioxide	124-38-9	N/Ap	N/Ap	N/Ap

<u>Ingredients</u>	CAS #	Toxicity to Algae		
		EC50 / 96h or 72h	NOEC / 96h or 72h	M Factor
Carbon dioxide	124-38-9	N/Ap	N/Ap	N/Ap

**Persistence and degradability**

: No information available. The methods for determining biodegradability are not applicable to inorganic substances.

**Bioaccumulation potential**

: No information available.

<u>Components</u>	<u>Partition coefficient n-octanol/water (log Kow)</u>	<u>Bioconcentration factor (BCF)</u>
Carbon dioxide (CAS 124-38-9)	N/Av	no bioaccumulation

**Mobility in soil**

: No information available.

**Other Adverse Environmental effects**

: No information available.

### SECTION 13. DISPOSAL CONSIDERATIONS

**Handling for Disposal**

: Handle in accordance with good industrial hygiene and safety practice. See Section 7 (Handling and Storage) for further details. Allow to safely dissipate into atmosphere. Do not puncture or incinerate containers.

**Methods of Disposal**

: Return to vendor with cylinder valve tightly closed and valve cap in place. Dispose in accordance with all applicable federal, state, provincial and local regulations.

**RCRA**

: If this product, as supplied, becomes a waste in the United States, it may meet the criteria of a hazardous waste as defined under RCRA, Title 40 CFR 261. It is the responsibility of the waste generator to determine the proper waste identification and disposal method. For disposal of unused or waste material, check with local, state and federal environmental agencies.





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### Canadian Information:

Canadian Environmental Protection Act (CEPA) information: All ingredients listed appear on the Domestic Substances List (DSL).

WHMIS information: Refer to Section 2 for a WHMIS Classification for this product.

### International Information:

Components listed below are present on the following International Inventory list:

<u>Ingredients</u>	<u>CAS #</u>	<u>European EINECS</u>	<u>Australia AICS</u>	<u>Philippines PICCS</u>	<u>Japan ENCS</u>	<u>Korea KECI/KECL</u>	<u>China IECSC</u>	<u>NewZealand IOC</u>
Carbon dioxide	124-38-9	204-696-9	Present	Present	(1)-310; (1)-169	KE-04683	Present	HSR001018

### SECTION 16. OTHER INFORMATION

#### Legend

: ACGIH: American Conference of Governmental Industrial Hygienists  
 AICS: Australian Inventory of Chemical Substances  
 CA: California  
 CAS: Chemical Abstract Services  
 CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980  
 EC50: Effective Concentration 50%  
 EINECS: European Inventory of Existing Commercial chemical Substances  
 ENCS: Existing and New Chemical Substances  
 EPA: Environmental Protection Agency  
 HSDB: Hazardous Substances Data Bank  
 IARC: International Agency for Research on Cancer  
 IECSC: Inventory of Existing Chemical Substances  
 Inh: Inhalation  
 IOC: Inventory of Chemicals  
 KECI: Korean Existing Chemicals Inventory  
 KECL: Korean Existing Chemicals List  
 LC: Lethal Concentration  
 LD: Lethal Dose  
 MA: Massachusetts  
 MN: Minnesota  
 N/Ap: Not Applicable  
 N/Av: Not Available  
 NIOSH: National Institute of Occupational Safety and Health  
 NJ: New Jersey  
 NOEC: No observable effect concentration  
 NTP: National Toxicology Program  
 OECD: Organisation for Economic Co-operation and Development  
 OSHA: Occupational Safety and Health Administration  
 PA: Pennsylvania  
 PEL: Permissible exposure limit  
 PICCS: Philippine Inventory of Chemicals and Chemical Substances  
 RCRA: Resource Conservation and Recovery Act  
 RI: Rhode Island  
 RQ: Reportable Quantity  
 RTECS: Registry of Toxic Effects of Chemical Substances  
 SARA: Superfund Amendments and Reauthorization Act  
 SCBA: Self-Contained Breathing Apparatus  
 STEL: Short Term Exposure Limit  
 TDG: Canadian Transportation of Dangerous Goods Act & Regulations

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TLV: Threshold Limit Values  
 TSCA: Toxic Substance Control Act  
 TWA: Time Weighted Average  
 WHMIS: Workplace Hazardous Materials Identification System

**References**

- : 1. ACGIH, Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices
- 2. ECHA - European Chemical Agency
- 3. Canadian Centre for Occupational Health and Safety, CCInfoWeb databases
- 4. Safety Data Sheets from manufacturer.
- 5. US EPA Title III List of Lists
- 6. California Proposition 65 List
- 7. OECD - The Global Portal to Information on Chemical Substances - eChemPortal

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**Other special considerations for handling**

: Provide adequate information, instruction and training for operators.

<p><b><u>Prepared for:</u></b>          Innovair Industrial Limited          150 McPhillips Street          Winnipeg, MB R3E 2J9          Telephone: 800-667-3344</p>	
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