Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name:	Carbon Dioxide/Flammable Gas Mixture	**Trade Name:**	Carbon Dioxide/Flammable Gas Mixture
Product Use:	Many.		
Chemical Name:	Carbon Dioxide/Flammable Gas Mixture	**Synonym:**	Not applicable.
Chemical Formula:	Not applicable.	**Chemical Family:**	Not applicable.
Telephone:	**Emergencies:** * 1-800-363-0042	**Supplier /Manufacture:**	Praxair Canada Inc. 1 City Centre Drive Suite 1200 Mississauga, ON L5B 1M2
		Phone:	905-803-1600
		Fax:	905-803-1682

**Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Praxair sales representative.*

2. Composition and Information on Ingredients

INGREDIENTS	% (VOL)	CAS NUMBER	LD_{50} (Species & Routes)	LC_{50} (Rat, 4 hrs.)	TLV-TWA (ACGIH)
Carbon dioxide	0.1 - 98.2	124-38-9	Not available.	Not available.	5000 ppm
AND CONTAINS ONE OR MORE OF THE FOLLOWING GASES:					
Butane	1.8 - 99.9	106-97-8	Not available.	Not available.	1000 ppm
1-Butene	1.8 - 99.9	106-98-9	Not available.	Not available.	250 ppm
Deuterium	4.9 - 99.9	7782-39-0	Not available.	Not available.	Not available.
Ethane	2.9 - 99.9	74-84-0	Not available.	Not available.	1000 ppm
Ethylene	2.7 - 99.9	74-85-1	Not available.	Not available.	200 ppm
Hydrogen	4 - 99.9	1333-74-0	Not available.	Not available.	Simple asphyxiant.
Isobutane	1.8 - 99.9	75-28-5	Not available.	Not available.	1000 ppm
Methane	5 - 99.9	74-82-8	Not available.	Not available.	1000 ppm
Propane	2.1 - 99.9	74-98-6	Not available.	Not available.	1000 ppm
Propylene	2 - 99.9	115-07-1	Not available.	Not available.	500 ppm

3. Hazards Identification

Emergency Overview

DANGER! Flammable, high-pressure gas. May form explosive mixture with air. Can cause rapid suffocation. Can increase heart rate. Can increase respiration. May cause dizziness and drowsiness. Self-contained breathing apparatus may be required by rescue workers.

ROUTES OF EXPOSURE: Inhalation.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION: May be mildly irritating to mucous membranes. At high concentrations, may cause drowsiness. At very high concentration, may act as an asphyxiant and cause headache, drowsiness, dizziness, excitation, excess salivation, vomiting, and unconsciousness. Lack of oxygen can cause death.

SKIN CONTACT: This product is a gas.

SKIN ABSORPTION: No evidence of adverse effects from available information.

SWALLOWING: A highly unlikely route of exposure. This product is a gas at normal temperature and pressure.

EYE CONTACT: Relatively non-irritating.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: None.

OTHER EFFECTS OF OVEREXPOSURE:
Damage to retinal ganglion cells and central nervous system may occur.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
Repeated or prolonged exposure is not known to aggravate medical condition.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:

A single study has shown an increased heart rate in rats exposed to 6% CO_2 in air for 24 hours, at different times during gestation. There is no evidence that CO_2 is tetratogenic in humans.

CARCINOGENICITY:

Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [Ethylene].
Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [Propylene].

4. First Aid Measures

INHALATION:

Remove to fresh air. If not breathing, give artifical respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

SKIN CONTACT:

This product is a gas.

SWALLOWING:

This product is a gas at normal temperature and pressure.

EYE CONTACT:

This product is a gas.

NOTES TO PHYSICIAN:

There is no specific antidote. Treatment of over-exposure should be directed at the control of symptoms and the clinical condition.

5. Fire Fighting Measures

FLAMMABLE :	Yes.	**IF YES, UNDER WHAT CONDITIONS?**	See Unusual Fire and Explosion Hazards.
FLASH POINT (test method)	Not applicable.	**AUTOIGNITION TEMPERATURE**	Not available.
FLAMMABLE LIMITS IN AIR, % by volume:	**LOWER:** See "Wt%" in Sect. IX	**UPPER:**	Varies

EXTINGUISHING MEDIA:

CO2, dry chemical, water spray or fog.

SPECIAL FIRE FIGHTING PROCEDURES:

DANGER! Evacuate all personnel from danger area. Immediately deluge cylinders with water from maximum distance until cool; then move them away from fire area if without risk. Self-contained breathing apparatus may be required by rescue workers. If containers are leaking, reduce vapours with water spray or fog. Shut off leak if without risk. Move containers away form fire area if without risk.

UNUSUAL FIRE AND EXPLOSION HAZARD:

Flammable gas. Forms explosive mixtures with air and oxidizing agents. Container may rupture due to heat of fire. Do not extinguish flames due to possibility of explosive re-ignition. Vapours form from this product and may travel or be moved by air currents an ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharges, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with approved device. No part of a container should be subjected to temperature higher than 52 C. Most containers are provided with a pressure relief device designed to vent contents when they are exposed to elevated temperature.

HAZARDOUS COMBUSTION PRODUCTS:

These products are carbon oxides (CO, CO2).

SENSITIVITY TO IMPACT:

Avoid impact against container.

SENSITIVITY TO STATIC DISCHARGE:

Not available.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

DANGER! Forms explosive mixtures with air. Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus operated in the pressure demand mode and appropriate protective clothing. Remove all sources of ignition if without risk. Reduce vapours with fog or fine water spray. Shut off leak if without risk. Ventilate area of leak or move leaking container to well ventilated area. Flammable vapours may spread from spill. Before entering area, especially confined areas, check atmosphere with appropriate device.

WASTE DISPOSAL METHOD:

Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, provincial, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN STORAGE:

Store and use with adequate ventilation. Separate flammable cylinders from oxygen, chlorine, and other oxidizers by at least 6.1 m or use a barricade of non-combustible material. This barricade should be at least 1.53 m high and have a fire resistance rating of at least ½ hour. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Post “No Smoking or Open Flames” signs in storage and use areas. There must be no sources of ignition. All electrical equipment in storage areas must be explosion-proof. Storage areas must meet national electric codes for Class 1 hazardous areas. Store only where temperature will not exceed 52 C. Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods. For full details and requirements, see NFPA 50A, published by the National Fire Protection Association.

PRECAUTIONS TO BE TAKEN IN HANDLING:

Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. If valve is hard to open, discontinue use and contact your supplier.

For additional information on stroage and handling, refer to Compressed Gas Association (CGA) pamphlet P-1, *Safe Handling of Compressed Gases in Containers*, available from the CGA. Refer to Section 16 for the address and phone number along with a list of other available publications.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE:

Flammable high-pressure gas. Use only in a closed system. Use piping and equipment adequately designed to withstand pressures and temperatures to be encountered. Use only spark-proof tools and explosion-proof equipment. Keep away from heat, open flame and sparks. **Gas can cause rapid suffocation due to oxygen deficiency.** Store and use with adequate ventilation. Close valve after each use; keep closed even when empty. **Prevent reverse flow.** Reverse flow into cylinder may cause rupture. Use a check valve or other protective device in any line or piping from the cylinder. **Never work on a pressurized system.** If there is a leak, close the cylinder valve. Blow the system down in an environmentally safe manner in compliance with all federal, provincial, and local laws, then repair the leak. **Never place a compressed gas cylinder where it may become part of an electrical circuit.**

8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST:	Explosion-proof system is acceptable.
MECHANICAL (general):	See SPECIAL.
SPECIAL:	Use only in a closed system.
OTHER:	See SPECIAL.

PERSONAL PROTECTION:

RESPIRATORY PROTECTION:	Wear appropriate respirator when ventilation is inadequate. Select in accordance with provincial regulations, local bylaws or guidelines. Selection should also be based on the current CSA standard Z94.4, "Selection, Care and Use of Respirators". Respirators should also be approved by NIOSH and MSHA.
SKIN PROTECTION:	Insulated Neoprene.

EYE PROTECTION: Wear safety glasses when handling cylinders.

Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. Protective clothing where needed. Cuffless trousers should be worn outside the shoes. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines.

9. Physical and Chemical Properties

PHYSICAL STATE:	Gas.	**FREEZING POINT:**	Not available.	**pH:**	Not available.
BOILING POINT	Not available.	**VAPOUR PRESSURE**	Not applicable.	**MOLECULAR WEIGHT:**	Not applicable.
SPECIFIC GRAVITY: LIQUID (Water = 1)	Not available.	**SOLUBILITY IN WATER,**	Not available.		
SPECIFIC GRAVITY: VAPOUR (air = 1)	Not available.	**EVAPORATION RATE** (Butyl Acetate=1):	Not available.	**COEFFICIENT OF WATER/OIL DISTRIBUTION:**	Not applicable.
VAPOUR DENSITY:	Not available.	**% VOLATILES BY VOLUME:**	Not available.	**ODOUR THRESHOLD:**	Not available.

APPEARANCE & ODOUR: Colourless gas at normal temperature and pressure. NOTE: This mixture has not been tested.

10. Stability and Reactivity

STABILITY:	The product is stable.
CONDITIONS OF CHEMICAL INSTABILITY:	Temperatures in excess of 435 C. See Section 7.
INCOMPATIBILITY (materials to avoid):	Oxidizing agents. Nickel carbonyl and oxygen mixtures.
HAZARDOUS DECOMPOSITION PRODUCTS:	Thermal decomposition or burning may produce carbon monoxide/carbon dioxide.
HAZARDOUS POLYMERIZATION:	Will not occur.
CONDITIONS OF REACTIVITY:	None currently known.

11. Toxicological Information

See section 3.

Carbon dioxide is an asphyxiant. It initially stimulates respiration and then causes respiratory depression. High concentrations result in narcosis. Symptoms in humans are as follows:

EFFECTS:	CO_2 CONCENTRATION:
Breathing rate increases slightly.	1%
Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness.	2%
Breathing increases to twice normal rate and become labored. Weak narcotic effect. Impaired hearing, headache, increased blood pressure and pulse rate.	3%
Breathing increases to approximately four times normal rate, symptoms of intoxication become evident, and slight choking may be felt.	4 - 5%
Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment, and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness.	5 - 10%
Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation.	50 - 100%

12. Ecological Information

No adverse ecological effects expected. This product does not contain any Class I or Class II ozone-depleting chemicals. The components of this mixture are not listed as marine pollutants by TDG Regulations.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

14. Transport Information

TDG/IMO SHIPPING NAME: Compressed gas, flammable , n.o.s. (name of major flammable component).

HAZARD CLASS:	IDENTIFICATION #:	PRODUCT REPORTABLE QUANTITY (PRQ):
CLASS 2.1: Flammable gas.	UN1954	Any accidental release in a quantity that could pose a danger to public safety or any sustained release of 10 minutes or more

SHIPPING LABEL(s): Flammable gas

PLACARD (when required): Flammable gas

SPECIAL SHIPPING INFORMATION:

Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, non-ventilated compartment of a vehicle can present serious safety hazards.

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, provincial, and local regulations.

DSL (Canada) This product is on the DSL list

WHMIS (Canada) CLASS A: Compressed gas.
CLASS B-1: Flammable gas.

International Regulations

EINECS	Not available.
DSCL (EEC)	This product is not classified according to the EU regulations.
International Lists	No products were found.

16. Other Information

MIXTURES:

When two or more gases, or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist, or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

HAZARD RATING SYSTEM:

HMIS RATINGS:

HEALTH	**0**
FLAMMABILITY	**4**
PHYSICAL HAZARD	**2**

*An Asterisk used in conjuction whith HMIS health hazards ratings designates a carcinogenic or reproductive hazard.

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED:	CGA-350
PIN-INDEXED YOKE:	Not available.
ULTRA-HIGH-INTEGRITY CONNECTION:	Not available.

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlets V-1 and V-7 listed below.

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information about this product can be found in the following pamphlets published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, Fax (703) 961-1831, website: www.cganet.com.

AV-1	Safe Handling and Storage of Compressed Gas
P-1	Safe Handling of Compressed Gases in Containers
P-14	Accident Prevention in Oxygen-Rich, Oxygen-Deficient Atmospheres
SB-2	Oxygen-Deficient Atmospheres
V-1	Compressed Gas Cylinder Valve Inlet and Outlet Connections
V-7	Standard Method of Determining Cylinder Valve Outlet Connections for Industrial Gas Mixtures
---	Handbook of Compressed Gases, Fifth Edition

For more indepth information for each component, refer to the pure product MSDS.

The information contained in this MSDS is generated from technical sources using the Chemmate Mixture MSDS system and the pure-product MSDS for each component. These mixtures are not tested as a whole for chemical, physical, or health effects.

PREPARATION INFORMATION:

DATE:	**October 15, 2013**
DEPARTMENT:	**Safety and Environmental Services**
TELEPHONE:	**905-803-1600**

The opinions expressed herein are those of qualified experts within Praxair Canada Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair Canada Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair Canada Inc. requests the users of this product to study this Material Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety nformation, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

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