

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Compressed gases, n.o.s. (nitrogen, carbon dioxide) (MSDS No. P-6222-A)	Trade Name: BAR Mixtures
Chemical Name: Mixtures of nitrogen, carbon dioxide, carbon monoxide, and propane	Synonyms: Not applicable
Formula: Mixtures of N ₂ , CO ₂ , CO, C ₃ H ₈	Chemical Family: Not applicable
Telephone: Emergencies: 1-800-645-4633* CHEMTREC: 1-800-424-9300* Routine: 1-800-PRAXAIR	Company Name: Praxair, Inc. 39 Old Ridgebury Road Danbury, CT 06810-5113

* Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier, Praxair sales representative, or call 1-800-PRAXAIR (1-800-772-9247).

2. Composition/Information on Ingredients

This section covers materials of manufacture only. For custom mixtures of this product, request an MSDS for each component. See section 16 for important information about mixtures.

INGREDIENT	CAS NUMBER	CONCENTRATION	OSHA PEL	ACGIH TLV-TWA (1999)
Propane	74-98-6	200-3200 ppm	1000 ppm	2500 ppm
Carbon Dioxide	124-38-9	0-14%	5000 ppm	5000 ppm; 30,000 ppm, 15 min, TLV-STEL
Carbon Monoxide	630-08-0	0.5-8%	50 ppm	25 ppm
Nitrogen	7727-37-9	Balance	None currently established	Simple asphyxiant

3. Hazards Identification

EMERGENCY OVERVIEW

WARNING! High-pressure gas.
Can cause rapid suffocation.
May increase respiration and heart rate.
May cause red blood cell damage.
May cause respiratory and nervous system damage.
May cause dizziness and drowsiness.
Self-contained breathing apparatus may be required by rescue workers.
Odor: Unknown

THRESHOLD LIMIT VALUE: TLV-TWA, 25 ppm, carbon monoxide (ACGIH, 1999). TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION—This mixture is an asphyxiant with effects due to lack of oxygen. Lack of oxygen can kill. Depending on the concentration and duration of exposure, the carbon monoxide (CO) component may add pallor, cyanosis, nausea, hallucinations, confusion, angina, and convulsions to the other symptoms. With well-established poisoning, the mucosal surface will be bright red (cherry red). The carbon dioxide (CO₂) component is physiologically active, affecting circulation and breathing. Moderate concentrations may cause headache, drowsiness, dizziness, stinging of the nose and throat, excitation, rapid breathing and heart rate, excess salivation, vomiting, and unconsciousness.

SKIN CONTACT—No harm expected from vapor. Liquid may cause frostbite.

SWALLOWING—An unlikely route of exposure. This product is a gas at normal temperature and pressure.

EYE CONTACT—No harm expected.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: Repeated hypoxia from CO exposure will cause gradually increasing central nervous system (CNS) damage, with loss of sensation in the fingers, poor memory, and mental deterioration. Chronic exposure may facilitate development of atherosclerosis.

OTHER EFFECTS OF OVEREXPOSURE: Other effects of exposure to CO include embryotoxicity, impaired cardiovascular function, pulmonary edema, pneumonia, gross neuropsychiatric damage, memory impairment, permanent CNS damage, and cerebral edema with irreversible brain damage. Late, fatal demyelination is a rare, but possible, complication.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: Hypoxia from carboxy-hemoglobin formation due to the CO component may aggravate established coronary and cerebral circulatory insufficiency.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: CO produces embryofetal toxicity in laboratory animals, but only at doses that cause maternal toxicity. There is no information available on possible effects in humans. A single study has shown an increase in heart defects in rats exposed to 6% carbon dioxide in air for 24 hours at different times during gestation. There is no evidence that carbon dioxide is teratogenic in humans.

CARCINOGENICITY: None of the components of this mixture is listed by NTP, OSHA, or IARC.

4. First Aid Measures

INHALATION: Immediately remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

SKIN CONTACT: Wash with soap and water. If discomfort persists, seek medical attention.

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

EYE CONTACT: An unlikely route of exposure. Flush with water. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Get medical attention if discomfort persists.

NOTES TO PHYSICIAN: *There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. Angina and depression of the ST segment of the electrocardiogram indicates myocardial hypoxia due to the CO component. Exposure to high concentrations of CO can result in cerebral edema. With severe CO doses, the use of hyperbaric oxygen may be beneficial. Individuals repeatedly overexposed to CO may present positive Romberg's sign.*

5. Fire Fighting Measures

FLASH POINT (test method):	Not applicable	
AUTOIGNITION TEMPERATURE:	Not applicable	
FLAMMABLE LIMITS IN AIR , % by volume:	LOWER: Not applicable	UPPER: Not applicable
EXTINGUISHING MEDIA: This mixture cannot catch fire. Use media appropriate for surrounding fire.		

SPECIAL FIRE FIGHTING PROCEDURES: WARNING! High-pressure gas. Asphyxiant; contains toxic carbon monoxide. 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. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Heat of fire can build pressure in cylinder and cause it to rupture. No part of cylinder should be subjected to a temperature higher than 125°F (52°C). Cylinders containing this mixture are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.)

HAZARDOUS COMBUSTION PRODUCTS: See section 10.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: WARNING! High-pressure gas. Asphyxiant; contains toxic carbon monoxide. Evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Shut off leak if you can do so without risk. Ventilate area or move cylinder to a well-ventilated area. Test for sufficient oxygen, especially in confined spaces, before allowing reentry.

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, state, 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. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 125°F (52°C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

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 other precautions in using BAR mixtures, see section 16.

8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST—Use a local exhaust system, if necessary, to control the concentration of this mixture in the worker's breathing zone.

MECHANICAL (general)—Under certain conditions, general exhaust ventilation may be acceptable to keep mixture concentration below the exposure limit.

SPECIAL—None

OTHER—None

RESPIRATORY PROTECTION: Use air-supplied respirators for concentrations up to 10 times the applicable permissible exposure limit. For higher concentrations, a full-face, self-contained breathing apparatus is required. Respiratory protection must conform to OSHA rules as specified in 29 CFR 1910.134.

SKIN PROTECTION: Wear work gloves when handling cylinders.

EYE PROTECTION: Wear safety glasses when handling cylinders. Select eye protection in accordance with OSHA 29 CFR 1910.133.

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. For welding, see section 16. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133. Regardless of protective equipment, never touch live electrical parts.

9. Physical and Chemical Properties

SPECIFIC GRAVITY (Air = 1) at 70°F (21.1°C) and 1 atm:	0.969 to 1.047 (calculated)
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SOLUBILITY IN WATER:	Slight
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PERCENT VOLATILES BY VOLUME:	100
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APPEARANCE, ODOR, AND STATE: Colorless gas at normal temperature and pressure; odor unknown.

10. Stability and Reactivity

STABILITY: Unstable Stable

INCOMPATIBILITY (materials to avoid): Alkali metals, alkaline earth metals, aluminum, ammonia, chromium, halogens, metal acetylides, nitric acid, oxidizing agents, potassium; magnesium above 1427°F (775°C), titanium above 1022°F (550°C), uranium above 1382°F (750°C).

HAZARDOUS DECOMPOSITION PRODUCTS: The CO component will decompose above 752°F (400°C) to form CO₂ and carbon. Thermal decomposition or burning of C₃H₈ will produce CO and CO₂. Electrical discharges and high temperatures decompose CO₂ into CO and O₂.

HAZARDOUS POLYMERIZATION: May Occur Will Not Occur

CONDITIONS TO AVOID: Exposure to light or heat in the presence of moisture. CO will decompose above 752°F (400°C) to form CO₂ and carbon.

11. Toxicological Information

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:

EFFECT:	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 becomes 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. BAR Mixtures do not contain any Class I or Class II ozone-depleting chemicals. None of the mixture components is listed as a marine pollutant by DOT.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Keep waste from contaminating surrounding environment. Keep personnel away. Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

14. Transport Information

DOT/IMO SHIPPING NAME: Compressed gases, n.o.s. (nitrogen, carbon dioxide)

HAZARD CLASS: 2.2	IDENTIFICATION NUMBER: UN 1956	PRODUCT RQ: None
SHIPPING LABEL(s): NONFLAMMABLE GAS		
PLACARD (when required): NONFLAMMABLE GAS		

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of a vehicle can present serious safety hazards.

Shipment of compressed gas cylinders that have been filled without the owner's consent is a violation of federal law [49 CFR 173.301(b)].

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, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (ENVIRONMENTAL PROTECTION AGENCY)

CERCLA: COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): None

SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

SECTIONS 302/304: Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of extremely hazardous substances (40 CFR Part 355):

Threshold Planning Quantity (TPQ): None

Extremely Hazardous Substances (40 CFR 355): None

SECTIONS 311/312: Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:

IMMEDIATE: Yes

PRESSURE: Yes

DELAYED: Yes

REACTIVITY: No

FIRE: No

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

None of the components of this mixture requires reporting under Section 313.

40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION: Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

The propane component of this mixture is listed as a regulated substance in quantities of 10,000 lb (4536 kg) or greater.

TSCA: TOXIC SUBSTANCES CONTROL ACT: The components of this mixture are listed on the TSCA inventory.

OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

None of the components of this mixture is listed in Appendix A as a highly hazardous chemical.

STATE REGULATIONS:

CALIFORNIA: The carbon monoxide component of this mixture is listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

WARNING: Carbon monoxide is a chemical known to the State of California to cause birth defects or other reproductive harm.

(California Health and Safety Code §25249.5 et seq.)

PENNSYLVANIA: The components of this mixture are subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

16. Other Information

Be sure to read and understand all labels and instructions supplied with all containers of this product.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE: High-pressure gas. Asphyxiant; contains toxic carbon monoxide. Use piping and equipment adequately designed to withstand pressures to be encountered. ***Can cause rapid suffocation due to oxygen deficiency.*** Store and use with adequate ventilation. Close cylinder 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 a safe and environmentally sound manner in compliance with all federal, state, and local laws; then repair the leak. ***Never allow a compressed gas cylinder to become part of an electrical circuit.***

NOTE: *Prior to using any plastics, confirm their compatibility with the components of this mixture. Also be aware that corrosion of pure nickel in atmospheres of pure CO exceeds 50 mil/yr (1.27 mm/yr) at room temperatures.*

MIXTURES: When you mix two or more gases or liquefied gases, you can 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 evaluate the end product. Remember, gases and liquids have properties that can cause serious injury or death.

HAZARD RATING SYSTEMS:**NFPA RATINGS:**

HEALTH = 3
 FLAMMABILITY = 0
 REACTIVITY = 0
 SPECIAL = None

HMIS RATINGS:

HEALTH = 1
 FLAMMABILITY = 0
 REACTIVITY = 0

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED: 0-3000 psig CGA-350
PIN-INDEXED YOKE: 0-3000 psig Not applicable
ULTRA-HIGH-INTEGRITY CONNECTION: Not applicable

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlet V-1 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), 1725 Jefferson Davis Highway, Arlington, VA 22202-4102, Telephone (703) 412-0900.

AV-1 *Safe Handling and Storage of Compressed Gases*
 P-1 *Safe Handling of Compressed Gases in Containers*
 P-9 *Inert Gases—Argon, Nitrogen, and Helium*
 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, Third Edition*

Praxair asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, 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, Inc., it is the user's obligation to determine the conditions of safe use of the product.

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