



MATERIAL SAFETY DATA SHEET - CALIBRATION CHECK GAS

PRODUCT NAME: CARBON MONOXIDE (5 PPM TO 10%) IN AIR

MSDS NO: 48

Version:3

Date: January, 2000

1. Chemical Product and Company Identification

Gasco Affiliates, LLC
1933 Whitfield Park Loop
Sarasota, FL 34243

TELEPHONE NUMBER: (941) 755-8806 24-HOUR EMERGENCY NUMBER: 1-800-424-9300
FAX NUMBER: (941) 755-8920
E-MAIL: gasco@gte.net

PRODUCT NAME: CARBON MONOXIDE (5 PPM TO 10%) IN AIR
CHEMICAL NAME: Carbon Monoxide in air
COMMON NAMES/ SYNONYMS: None
TDG (Canada) CLASSIFICATION: 2.2
WHIMIS CLASSIFICATION: A, D1A,D2A, D2B

2. COMPOSITION/ INFORMATION ON INGREDIENTS

Table with 5 columns: INGREDIENT, %VOLUME, PEL-OSHA, TLV-ACGIH, LD50 or LC50 Route/Species. Rows include Carbon Monoxide and Air.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Inhaled Carbon monoxide binds to the blood hemoglobin, greatly reducing the red blood cell's ability to transport oxygen to body tissues. Effects may include headaches, dizziness, convulsions, loss of consciousness and death. Nonflammable.

ROUTE OF ENTRY:

Table with 5 columns: Skin Contact, Skin Absorption, Eye Contact, Inhalation, Ingestion. Rows show 'No' for Skin Contact, Skin Absorption, Eye Contact, Ingestion and 'Yes' for Inhalation.

Carcinogenicity: -NTP: No IARC: No OSHA: No

EYE EFFECTS:

N/A

SKIN EFFECTS:

N/A

INGESTION EFFECTS:

Ingestion unlikely. Gas at room temperature.



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PRODUCT NAME: CARBON MONOXIDE (5 PPM TO 10%) IN AIR

INHALATION EFFECTS:

If released in a confined area this product may displace oxygen and result in asphyxia.

Inhaled carbon monoxide binds with blood hemoglobin to form carboxyhemoglobin. Carboxyhemoglobin can not take part in normal oxygen transport, greatly reducing the blood's ability to transport oxygen. Depending on levels and duration of exposure, symptoms may include headache, dizziness, heart palpitations, weakness, confusion, nausea, and even convulsions, eventual unconsciousness and death.

NFPA HAZARD CODES

Health: 2
Flammability: 0
Reactivity: 0

HMIS HAZARD CODES

Health: 2
Flammability: 0
Reactivity: 0

RATING SYSTEM

0= No Hazard
1= Slight Hazard
2= Moderate Hazard
3= Serious Hazard
4= Severe Hazard

4. FIRST AID MEASURES

EYES:

N/A

SKIN:

N/A

INGESTION:

N/A

INHALATION:

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED THE SELF-CONTAINED BREATHING APPARATUS. Victims should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. If breathing has stopped administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

5. FIRE-FIGHTING MEASURES

These containers hold gas under pressure, with no liquid phase. If involved in a major fire, they should be sprayed with water to avoid pressure increases, otherwise pressures will rise and ultimately they may distort or burst to release the contents. The gases will not add significantly to the fire, but containers or fragments may be projected considerable distances - thereby hampering fire fighting efforts.

6. ACCIDENTAL RELEASE MEASURES

In terms of weight, these containers hold very little contents, such that any accidental release by puncturing etc. will be of no practical concern.

7. HANDLING AND STORAGE

Suck back of water into the container must be prevented. Do not allow backfeed into the container. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Use only in well-ventilated areas. Do not heat cylinder by any means to increase rate of product from the cylinder. Do not allow the temperature where cylinders are stored to exceed 130°F (54°C).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Use adequate ventilation for extended use of gas.



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9. PHYSICAL AND CHEMICAL PROPERTIES

PARAMETER:	VALUE:
Physical state	: Gas
Evaporation point	: N/A
pH	: N/A
Odor and appearance	: Colorless, odorless gas

10. STABILITY AND REACTIVITY

Stable under normal conditions. Expected shelf life 24 months.

11. TOXICOLOGICAL INFORMATION

Inhalation of 150 ppm carbon monoxide for 24 hours by pregnant rats produced cardiovascular and behavioral defects in offspring. Toxic effects to fertility were observed in female rats exposed to 1 mg/m³ for 24 hours.

Genetic changes observed in mammalian cell assay systems at exposures of 1500 to 2500 ppm for 10 minutes.

12. ECOLOGICAL INFORMATION

No ecological damage caused by this product.

13. DISPOSAL INFORMATION

Do not discharge into any place where its accumulation could be dangerous. Used containers are acceptable for disposal in the normal waste stream as long as the cylinder is empty and valve removed or cylinder wall is punctured; but GASCO encourages the consumer to return cylinders.

14. TRANSPORT INFORMATION

	<u>United States DOT</u>	<u>Canada TDG</u>
PROPER SHIPPING NAME:	Compressed Gas N.O.S. (Carbon Monoxide In Air)	Compressed Gas N.O.S. (Carbon Monoxide In Air)
HAZARD CLASS:	2.2	2.2
IDENTIFICATION NUMBER:	UN1956	UN1956
SHIPPING LABEL:	NONFLAMMABLE GAS	NONFLAMMABLE GAS

15. REGULATORY INFORMATION

Classified non-flammable/non-toxic according to Directives 88/379/EEC, 67/548/EEC and the UK's CHIP 96 Regulations.

16. OTHER INFORMATION

This MSDS has been prepared in accordance with the Chemicals (Hazard Information and Packaging for Supply (Amendment) Regulation 1996. The information is based on the best knowledge of GASCO, and its advisors and is given in good faith, but we cannot guarantee its accuracy, reliability or completeness and therefore disclaim any liability for loss or damage arising out of use of this data. Since conditions of use are outside the control of the Company and its advisors we disclaim any liability for loss or damage when the product is used for other purposes than it is intended.

MSDS/S010/48/January, 2000

PRODUCT NAME: CARBON MONOXIDE (< 1%) AND OXYGEN (20-23.5%) IN NITROGEN**1. Product and Company Identification****BOC Gases,
Division of,
The BOC Group, Inc.
575 Mountain Avenue
Murray Hill, NJ 07974****BOC Gases
Division of
BOC Canada Limited
5975 Falbourne Street, Unit 2
Mississauga, Ontario L5R 3W6****TELEPHONE NUMBER: (908) 464-8100
24-HOUR EMERGENCY TELEPHONE NUMBER:
CHEMTREC (800) 424-9300****TELEPHONE NUMBER: (905) 501-1700
24-HOUR EMERGENCY TELEPHONE NUMBER:
(905) 501-0802
EMERGENCY RESPONSE PLAN NO: 2-0101****PRODUCT NAME: CARBON MONOXIDE (< 1%) AND OXYGEN (20-23.5%) IN NITROGEN
CHEMICAL NAME: Carbon Monoxide (< 1%), and Oxygen (20-23.5%) in Nitrogen
COMMON NAMES/SYNONYMS: Not Applicable
TDG (Canada) CLASSIFICATION: 2.2
WHMIS CLASSIFICATION: A, D2A****PREPARED BY: Loss Control (908)464-8100/(905)501-1700
PREPARATION DATE: 02/17/04
REVIEW DATES: Not Applicable****2. Composition, Information on Ingredients****EXPOSURE LIMITS¹:**

INGREDIENT	% VOLUME	PEL OSHA ²	TLV-ACGIH ³	LD ₅₀ or LC ₅₀ Route/Species
Nitrogen FORMULA: N ₂ CAS: 7727-37-9 RTECS #: QW9700000	Balance	None Established	Simple Asphyxiant	Not Available
Oxygen FORMULA: O ₂ CAS: 7782-44-7 RTECS #: RS2060000	20-23.5	None Established	Not Available	Not Available
Carbon Monoxide FORMULA: CO CAS: 630-08-0 RTECS #: FG3500000	< 1	50 ppm TWA	25 ppm TWA	LC ₅₀ : 3760 ppm/1 H inhalation/rat (1 H, time adjusted; CGA P-23)

¹ Refer to individual state or provincial regulations, as applicable, for limits which may be more stringent than those listed here.² As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)³ As stated in the ACGIH 2003 Threshold Limit Values for Chemical Substances and Physical Agents.

OSHA Regulatory Status: This material is classified as hazardous under OSHA regulations.

PRODUCT NAME CARBON MONOXIDE (< 1%) AND OXYGEN (20-23.5%) IN NITROGEN

3. Hazards Identification

EMERGENCY OVERVIEW
Odorless, colorless non-flammable compressed gas. Inhalation of carbon monoxide may reduce the ability of the blood to carry oxygen and adversely affect fetal development. Contents under pressure. Use and store below 125 °F.

ROUTE OF ENTRY:

Skin Contact No	Skin Absorption No	Eye Contact No	Inhalation Yes	Ingestion No
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HEALTH EFFECTS:

Exposure Limits Yes	Irritant No	Sensitization No
Teratogen Yes	Reproductive Hazard Yes	Mutagen Yes
Synergistic Effects None reported		

Carcinogenicity: -- NTP: No IARC: No OSHA: No

EYE EFFECTS: None known.

SKIN EFFECTS: None known.

INGESTION EFFECTS: None known. Ingestion is unlikely as product is gas at room temperature.

ACUTE INHALATION EFFECTS: Product contains sufficient oxygen content to support life and less than 1% carbon monoxide.

Carbon monoxide is odorless and colorless. There may be no warning of overexposure until symptoms occur. Inhaled carbon monoxide binds with blood hemoglobin to form carboxyhemoglobin, a substance that can not take part in normal oxygen transport. This greatly reduces the blood's ability to transport oxygen. Depending on levels and duration of exposure, symptoms may include headache, dizziness, heart palpitations, weakness, confusion, nausea, and even convulsions, eventual unconsciousness and death. Lack of oxygen produced by carbon monoxide may produce immediate as well as delayed neurological problems. Inhalation of carbon monoxide may also adversely affect fetal development.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None known. Individuals with anemia, lung disease, cerebrovascular disease, heart disease, smokers, and children are expected to be more susceptible to the effects of carbon monoxide.

POTENTIAL ENVIRONMENTAL EFFECTS: Ecotoxicity values were unavailable. Toxic effects are expected to be similar to those seen in humans and test animals.

4. First Aid Measures

EYES: None required.

SKIN: None required.

PRODUCT NAME: CARBON MONOXIDE (< 1%) AND OXYGEN (20-23.5%) IN NITROGEN

INGESTION: None required.

INHALATION: PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Conscious persons should be assisted to an uncontaminated area and treated with supplemental oxygen. Quick removal from the contaminated is most important. Unconscious persons should be moved to an uncontaminated area and given artificial respiration and oxygen at the same time. The physician should be informed that the patient has been overexposed to carbon monoxide.

5. Fire Fighting Measures

Conditions of Flammability: Nonflammable		
Flash point: None	Method: Not Applicable	Autoignition Temperature: None
LEL(%): None	UEL(%): None	
Hazardous combustion products: None		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: None		

FIRE AND EXPLOSION HAZARDS:

Nonflammable. Contains sufficient oxygen to support combustion. Cylinder may vent rapidly or rupture violently from pressure when involved in a fire situation.

EXTINGUISHING MEDIA:

None required. Use media appropriate for surrounding materials.

FIRE FIGHTING INSTRUCTIONS: Firefighters should wear a NIOSH/MSHA approved full-facepiece self-contained breathing apparatus (SCBA) operated in positive pressure mode and full turnout gear. Continue to cool fire-exposed cylinders with water until well after flames are extinguished.

6. Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment (See Section 8). Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. Ventilate enclosed areas. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest BOC location.

7. Handling and Storage

Electrical classification: Non-hazardous.

This gas mixture is non-corrosive and may be used with all common structural materials.

PRODUCT NAME CARBON MONOXIDE (< 1%) AND OXYGEN (20-23.5%) IN NITROGEN

Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve protection outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure-reducing regulator when connecting cylinder to lower pressure piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Do not insert any object (i.e.: screwdriver) into valve cap openings as this can damage the valve causing leakage.

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125 °F (52 °C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Use a "first in-first out" inventory system to prevent full cylinders being stored for excessive periods of time.

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure. For additional recommendations, consult Compressed Gas Association Pamphlets P-1.

8. Exposure Controls, Personal Protection

ENGINEERING CONTROLS: Use local exhaust in combination with general ventilation as necessary to control air contaminants to at or below acceptable exposure guidelines.

EYE/FACE PROTECTION: Safety goggles or glasses as appropriate for the job.

SKIN PROTECTION: Protective gloves appropriate for the job.

RESPIRATORY PROTECTION: None normally required. For emergency release use a positive pressure NIOSH approved air-supplying respirator systems (SCBA or airline/escape bottle) using at a minimum Grade D air.

OTHER/GENERAL PROTECTION: Safety shoes or other footwear as appropriate for the job.

9. Physical and Chemical Properties

PARAMETER	VALUE	UNITS
Physical state (gas, liquid, solid)	: Gas	
Vapor pressure	: Above critical temp.	
Vapor density at STP (Air = 1)	: Not Available	
Evaporation point	: Not Available	
Boiling point	: Not Available	
Freezing point	: Not Available	
PH	: Not Applicable	
Specific gravity	: Not Available	
Oil/water partition coefficient	: Not Available	
Solubility (H ₂ O)	: Slightly soluble	
Odor threshold	: Not Applicable	
Odor and appearance	: Odorless, colorless gas	

10. Stability and Reactivity

STABILITY: Stable

INCOMPATIBLE MATERIALS/CONDITIONS: None

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS POLYMERIZATION: Will not occur

11. Toxicological Information

INHALATION: The four hour LC₅₀ for carbon monoxide is 1807 ppm (rat).

SKIN AND EYE: Does not cause skin or eye irritation.

OTHER: Mice exposed to concentrations of carbon monoxide at 65 ppm and higher demonstrated dose-dependent effects on the fetus (i.e.: increased mortality and decreased weight) with no signs of maternal toxicity. Offspring of rats exposed at 150 ppm carbon monoxide had minor reductions in birth weight and persistent memory deficits which became more pronounced in adulthood. Fetal carboxyhemoglobin levels are generally 10-15% higher than maternal levels. Overexposure to carbon monoxide may also decrease the likelihood of successful pregnancy. In rats treated with carbon monoxide, the rate of successful pregnancy in the control group was 100% whereas the rate of successful pregnancy in animals treated with 30 and 90 ppm CO was 69% and 38% respectively.

Genetic changes were observed in mammalian cell assay systems at exposures of 1500 to 2500 ppm carbon monoxide for 10 minutes.

12. Ecological Information

Product does not contain Class I or Class II ozone depleting substances.

13. Disposal Considerations

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to BOC Gases or authorized distributor for proper disposal.

14. Transport Information

PARAMETER	United States DOT	Canada TDG
PROPER SHIPPING NAME:	Compressed gas, n.o.s. (Carbon monoxide, Oxygen)	Compressed gas, n.o.s.
HAZARD CLASS:	2.2	2.2
IDENTIFICATION NUMBER:	UN 1956	UN 1956
SHIPPING LABEL:	NONFLAMMABLE GAS	NONFLAMMABLE GAS

15. Regulatory Information

SARA TITLE III NOTIFICATIONS AND INFORMATION

SARA TITLE III - HAZARD CLASSES:

Sudden Release of Pressure Hazard
Acute Health Hazard

SARA TITLE III – SECTION 313 SUPPLIER NOTIFICATION:

This product does not contain ingredients subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

U.S. TSCA/Canadian DSL: All ingredients are listed on the U.S. Toxic Substances Control Act (TSCA) inventory or exempt from listing and on the Canadian Domestic Substance List (DSL).

California Proposition 65: This product contains an ingredient (carbon monoxide) known to the State of California to cause birth defects or other reproductive harm.

Canadian Controlled Products Regulations (CPR): This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

16. Other Information

NFPA HAZARD CODES

Health: 0
Flammability: 0
Instability: 0

HMIS HAZARD CODES

Health: 0
Flammability: 0
Reactivity: 0

RATINGS SYSTEM

0 = No Hazard
1 = Slight Hazard
2 = Moderate Hazard
3 = Serious Hazard
4 = Severe Hazard

Note: The Reactivity Hazard Rating is based on the 2nd Edition of the National Paint and Coatings Association's (NPCA's) Hazardous Materials Identification System (HMIS[®]). Hazard ratings were based on the best available information at the time of the review. Ratings will be re-assigned in accordance with Compressed Gas Association (CGA) guidelines as published in the future edition of CGA Pamphlet P-19.

PRODUCT NAME CARBON MONOXIDE (< 1%) AND OXYGEN (20-23.5%) IN NITROGEN

ACGIH	American Conference of Governmental Industrial Hygienists
DOT	Department of Transportation
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
SARA	Superfund Amendments and Reauthorization Act
STEL	Short Term Exposure Limit
TDG	Transportation of Dangerous Goods
TLV	Threshold Limit Value
WHMIS	Workplace Hazardous Materials Information System

Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of transportation regulations.

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).