

Carbon Monoxide in Air 0.0001% to 0.0999%

SDS Number: 2060

Revision Date: 5/28/2015

Page 1 of 9

1 PRODUCT AND COMPANY IDENTIFICATION

Manufacturer

Norlab - A Division of Norco, Inc.
898 W. Gowen Rd.
Boise, ID 83705

Contact: Quality Department
Phone: (208) 336-1643
Web: www.norlab-gas.com

Product Name: Carbon Monoxide in Air 0.0001% to 0.0999%
Revision Date: 5/28/2015
Version: 1
SDS Number: 2060
Common Name: Carbon Monoxide in Air
CAS Number: MIXTURE
Chemical Family: Gas Mixture
Chemical Formula: CO 0.0001% to 0.0999% in Air
Synonyms: Gas Mixture, Cal. Gas, 2

Emergency Telephone Number: (800) 424-9300 (CHEMTREC)

2 HAZARDS IDENTIFICATION

Inhalation: Depending on the concentration of the carbon monoxide present, this product may act as a simple asphyxiate or a chemical asphyxiate. This mixture contains sufficient oxygen to support life.

Inhaled carbon monoxide binds with blood hemoglobin to form carboxyhemoglobin. Carboxyhemoglobin cannot 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.

Some experimental evidence indicates teratogenic and reproductive effects.

Skin Contact: Contact with rapidly expanding gas near the point of release may cause frostbite with redness, skin color change to gray or white, and blistering.

Eye Contact: Contact with rapidly expanding gas near the point of release may cause frostbite.

Ingestion: None known. Ingestion is unlikely.

Carbon Monoxide in Air 0.0001% to 0.0999%

SDS Number: 2060

Revision Date: 5/28/2015

Page 2 of 9

NFPA:
HMIS III:

Health = 1, Fire = 0, Reactivity = 0
H1/F0/PH3



HMIS III	
HEALTH	1
FLAMMABILITY	0
PHYSICAL HAZARDS	3
PERSONAL PROTECTION B I Safety glasses, gloves	

PERSONAL PROTECTION INDEX			
A		G	
B		H	
C		I	
D		J	
E		K	
F		X	Consult your supervisor or S.O.P. for "SPECIAL" handling directions
A		n	
O		p	
q		r	
t		u	
w		y	
z		Additional Information	

GHS Signal Word:
WARNING

GHS Hazard Pictograms:



GHS Classifications:
Physical, Gases Under Pressure, Compressed Gas
Health, Acute toxicity, 5 Inhalation

GHS Phrases:
H280 - Contains gas under pressure; may explode if heated
H333 - May be harmful if inhaled
CGA-HG24 – Supports Combustion

GHS Precautionary Statements:
P260 - Do not breathe dust/fume/gas/mist/vapors/spray.
P271 - Use only outdoors or in a well-ventilated area.
P304+312 - IN INHALED: Call a POISON CENTER or doctor/physician if you feel unwell.
P304+340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P403+233 - Store in a well ventilated place. Keep container tightly closed.
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52 °C (125 °F).
CGA-PG05 – Use a back flow preventive device in the piping
CGA-PG06 – Close Valve after each use and when empty.
CGA-PG10 – Use only with equipment rated for cylinder pressure.
CGA-PG20 – Use only equipment of compatible materials of constructions.

Non-flammable, colorless, odorless gas. Carbon monoxide acts as a chemical asphyxiate, binding 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. Contents under pressure. Use and store below 125 °F (52 °C).

Carbon Monoxide in Air 0.0001% to 0.0999%

SDS Number: 2060

Revision Date: 5/28/2015

Page 3 of 9

3 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredients:

CAS #	I	Percentage	I	Chemical Name
N/A	I	99.9001-99.9999%	I	Air
630-08-0	I	0.0001-0.0999%	I	Carbon monoxide

4 FIRST AID MEASURES

Inhalation: PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO THIS PRODUCT. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Conscious persons should be assisted to an uncontaminated area and be treated with supplemental oxygen. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area and be given artificial respiration and oxygen at the same time. Administration of 100% oxygen by tight fitting face mask reduces the biological half-life of CO.

FOR SEVERELY POISONED PATIENTS, HYPERBARIC OXYGEN THERAPY SHOULD BE CONSIDERED. The administering of the oxygen at an elevated pressure (up to 2 to 2.5 atmospheres) has shown to be beneficial as has treatment in a hyperbaric chamber. The physician should be informed that the patient has inhaled toxic quantities of carbon monoxide.

Skin Contact: None required for gas. For frostbite, immerse skin in lukewarm water. DO NOT USE HOT WATER. Obtain medical attention.

Eye Contact: Never introduce ointment or oil into the eyes without medical advice! Remove victim from the source of contamination. Flush eyes with water for 15 minutes. If pain is present, refer the victim to an ophthalmologist for treatment and follow up. If the victim cannot tolerate light, protect the eyes with a light bandage. If frostbite is suspected, flush with cool water for 15 minutes and obtain immediate medical attention.

Ingestion: None anticipated; product is a gas.

Most important symptoms and effects, both acute and delayed:

The most important known symptoms and effects are described in the labeling (see Section 2) and/or Section 11.

Indication of any immediate medical attention and special treatment needed:

No data available.

5 FIRE FIGHTING MEASURES

Flammability:	Not flammable
Flash Point:	NA
Flash Point Method:	NA
Burning Rate:	Not determined
Autoignition Temp:	Not determined
LEL:	12.5% (CO)
UEL:	74.0% (CO)

Extinguishing Media:

Use as appropriate for surrounding material.

Carbon Monoxide in Air 0.0001% to 0.0999%

SDS Number: 2060

Revision Date: 5/28/2015

Page 4 of 9

Special Hazards Arising From the Substance or Mixture:

Carbon Oxides
Nitrogen gas
Nitrogen Oxides (NOx)
Oxygen gas

Advice for Firefighters:

If possible, stop the flow of gas supply. Continue to cool heat or flame exposed containers until well after the flames are extinguished. Firefighters should wear a full-face piece, NIOSH/MSHA-approved self-contained breathing apparatus (SCBA) operated in positive pressure mode and full turnout gear.

Further Information:

If incinerated, may release toxic fumes.
Use water spray to cool unopened containers.
Product is non-flammable. Concentration of carbon monoxide is below the **LEL** of 12.5% in air. This gas mixture contains sufficient oxygen to support combustion.
Cylinders may rupture violently from pressure when involved in a fire situation.
See Section 7 for more information on safe handling.
See Section 8 for more information on personal protection equipment.
See Section 13 for disposal information.

6

ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures:

Evacuate all personnel from affected area. Use appropriate protective equipment. 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 valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest Norco/NorLab location.

Environmental Precautions:

Prevent further release (leakage/spillage) if safe to do so.

Methods and Materials for Containments and Cleaning Up:

Contact the appropriate emergency telephone number listed in Section 1 or call your closest Norco/Norlab location. Ensure adequate ventilation.

Reference to Other Sections:

See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for information on proper disposal.

7

HANDLING AND STORAGE

Handling Precautions:

Carbon monoxide can be handled in all commonly used metals up to approximately 500 psig (3450 kPa). Above that pressure it forms toxic and corrosive carbonyl compounds with some metals. Carbon steels, aluminum alloys, copper and copper alloys, low carbon stainless steels and nickel-based alloys such as Hastelloy A, B & C are recommended for higher pressure applications.

Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve 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 (<3000 psig) piping systems. Do not heat cylinder by

Carbon Monoxide in Air 0.0001% to 0.0999%

SDS Number: 2060

Revision Date: 5/28/2015

Page 5 of 9

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 backflow into the cylinder.

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid from 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.

Storage Requirements:

Ensure adequate ventilation.

Protect cylinders from physical damage. Store in a cool, dry, well ventilated area of non-combustible construction away from heavy traffic 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. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders from being stored for excessive periods of time.

For additional recommendations, consult Compressed Gas Association Pamphlet P-1.

8

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:

All ventilation should be designed in accordance with OSHA standard (29 CFR 1910.94). Use local exhaust at filling zones and where leakage and dust formation is probable. Use mechanical (general) ventilation for storage areas. Use appropriate ventilation as required to keep Exposure Limits in Air below TLV & PEL limits.

Personal Protective Equip:

Eye/face protection:

When using material use a vapor respirator according to HMIS PP, U. All safety equipment should be tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

Skin protection:

Not required, but may be used. Gloves must be inspected prior to use. Dispose of contaminated gloves according to applicable laws and workplace practices.

Body Protection:

Not required, but may be used. Type of protective equipment should be selected based on concentration amount and conditions of use of this material. Use safety shoes.

Respiratory protection:

Use of a vapor respirator is recommended. A vapor respirator may be required as backup to engineering controls when proper engineering controls are not in place to keep TLV and PEL limits below defined thresholds. A NIOSH/MSHA-approved full-face piece SCBA operated in positive mode and/or any supplied air respirator with a full-face piece and operated in a positive pressure mode in combination with an auxiliary self contained breathing apparatus operated in positive pressure mode should be used for high or unknown concentrations. Respirators should be stored in an area not likely to be contaminated.

Control of environmental exposure:

Prevent leakage or spillage if safe to do so.

Components with workplace control parameters:

Component(s): Air; Carbon Monoxide
CAS No(s): N/A; 630-08-0

Carbon Monoxide in Air 0.0001% to 0.0999%

SDS Number: 2060

Revision Date: 5/28/2015

Page 6 of 9

USA NIOSH (TWA/REL): 35 ppm, 40 mg/m³

USA NIOSH (C/REL): 35 ppm, 27 mg/m³

USA ACGIH (TWA/TLV): 25 ppm

USA OSHA Occupational Exposure Limits Table Z-1 Limits for Air Contaminant (TWA): 50 ppm, 55 mg/m³

Biological occupational exposure limits:

Component: Carbon Monoxide

CAS-No: 630-08-0

Parameters: Carboxyhemoglobin; Carbon monoxide

Biological Specimen: In blood; In end-exhaled air

USA ACGIH Biological Exposure Indices: 3.5%; 20.0 ppm

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear, colorless gas	Odor:	Odorless
Physical State:	Gas	Molecular Formula:	MIXTURE
Odor Threshold:	Not determined	Solubility:	Very slight
Particle Size:	Not determined	Softening Point:	Not determined
Spec Grav./Density:	No data available	Percent Volatile:	100%
Viscosity:	Not determined	Heat Value:	Not determined
Sat. Vap. Conc.:	Not determined	Freezing/Melting Pt.:	Not determined
Boiling Point:	Not determined	Flash Point:	Not determined
Flammability:	(solid, gas): Not flammable	Octanol:	Not determined
Partition Coefficient:	Not determined	Vapor Density:	(air = 1): Not determined
Vapor Pressure:	Not determined	VOC:	Not determined
pH:	Not determined	Bulk Density:	NA
Evap. Rate:	Not determined	Auto-Ignition Temp:	Not determined
Molecular weight:	MIXTURE	LFL/UFL:	(% v/v): 12.5 / 74.0 (CO)
Decomp Temp:	Not determined		

10 STABILITY AND REACTIVITY

Stability:	Product is stable under normal conditions.
Conditions to Avoid:	Incompatibilities, flames, ignition sources.
Materials to Avoid:	Strong oxidizing agents, Sodium/sodium oxides, Potassium.
Hazardous Decomposition:	Carbon Oxides and Nitrogen Oxides (NOx).
Hazardous Polymerization:	Will not occur.

Carbon Monoxide in Air 0.0001% to 0.0999%

SDS Number: 2060

Revision Date: 5/28/2015

Page 7 of 9

11 TOXICOLOGICAL INFORMATION

Component(s): Air; Carbon Monoxide
CAS No(s): N/A; 630-08-0

Acute Toxicity:
LC50 Inhalation - Rat: 1,807 ppm (4 h)

Skin Corrosion/Irritation: No data available.

Serious Eye Damage/Eye Irritation: No data available.

Respiratory or Skin Sensitation: No data available.

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

Carcinogenicity:

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive Toxicity: Inhalation of 150 ppm of 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. Similar effects were observed for other mammalia species.

Specific Target Organ Toxicity - Single Exposure: No data available.

Specific Target Organ Toxicity - Repeated Exposure: Inhalation - Causes damage to organs through prolonged or repeated exposure.

Aspiration Hazard: No data available.

Additional Information:

Component: Air; RTECS: N/A

Component: Carbon Monoxide; RTECS: FG3500000

12 ECOLOGICAL INFORMATION

Component(s): Air; Carbon Monoxide
CAS No(s): N/A; 630-08-0

Toxicity:

Toxicity to fish:
No data available.

Carbon Monoxide in Air 0.0001% to 0.0999%

SDS Number: 2060

Revision Date: 5/28/2015

Page 8 of 9

Toxicity to daphnia and other aquatic invertebrates:
No data available.

Persistence and Degradability:
No data available.

Bioaccumulative potential:
No data available.

Mobility in Soil:
No data available.

Results of PBT and vPvB assessment:
Not required/conducted.

Other Adverse Effects:
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Product does not contain Class I or Class II ozone depleting substances.

13

DISPOSAL CONSIDERATIONS

Product and Contaminated Packaging: Do not attempt to dispose of residual waste or unused quantities in returnable containers. Return in the shipping container, properly labeled, with any valve outlet plugs or caps secure and valve protection cap in place to Norlab for proper disposal. Non-refillable containers should be vented in a well-ventilated area then disposed of in compliance with local regulations, or returned to Norlab.

14

TRANSPORT INFORMATION

DOT Class: Non-Flammable Gas (2.2) #2.2
UN #: UN 1956, Class: 2, Proper Shipping Name: Compressed gas, n.o.s. (Carbon Monoxide, Nitrogen)

DOT (US)

UN Number: 1956
Class: 2.2
ERG #: 126
Proper Shipping Name: Compressed gas, n.o.s. (Carbon Monoxide, Nitrogen)

IMDG

UN Number: 1956
Class: 2.2
EMS-No: F-C, S-V
Proper Shipping Name: Compressed gas, n.o.s. (Carbon Monoxide, Nitrogen)

IATA

UN Number: 1956
Class: 2.2
Proper Shipping Name: Compressed gas, n.o.s. (Carbon Monoxide, Nitrogen)

Canada TDG

UN Number: 1956
Class: 2.2

Carbon Monoxide in Air 0.0001% to 0.0999%

SDS Number: 2060

Revision Date: 5/28/2015

Page 9 of 9

Proper Shipping Name: Compressed gas, n.o.s. (Carbon Monoxide, Nitrogen)



15 REGULATORY INFORMATION

COMPONENT / (CAS/PERC) / CODES

*Air (N/A 99.9001-99.9999%) MASS, NJHS, PA, SARA311/312, TSCA

*Carbon monoxide (630080 0.0001-0.0999%) MASS, NJEHS, NJHS, OSHAWAC, PA, PROP65, SARA311/312, TSCA, TXAIR

REGULATORY KEY DESCRIPTIONS

- MASS = MA Massachusetts Hazardous Substances List
- NJEHS = NJ Extraordinarily Hazardous Substances
- NJHS = NJ Right-to-Know Hazardous Substances
- OSHAWAC = OSHA Workplace Air Contaminants
- PA = PA Right-To-Know List of Hazardous Substances
- PROP65 = CA Prop 65
- SARA311/312 = SARA 311/312 Toxic Chemicals
- TSCA = Toxic Substances Control Act
- TXAIR = TX Air Contaminants with Health Effects Screening Level

16 OTHER INFORMATION

Disclaimer:

The data in this Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material in any process. The information set forth herein is furnished free of charge and is based on technical data that Norlab believes to be reliable. It is intended for use by persons having technical skill and at their own discretion and risk. Since conditions of use are outside of Norlab's control, Norlab makes no warranties, expressed or implied, and assumes no liability in connection with any use of this information. Nothing herein is to be taken as a license to operate under, or a recommendation to infringe upon, any patents.