NorLAB
A DIVISION OF NORCO, INC.

SDS Safety Data Sheet

0.0001% - 0.0999% Carbon Monoxide In Air

SDS Number: NLB 2060 Revision Date: 12/8/2017

1 PRODUCT AND COMPANY IDENTIFICATION

Manufacturer

NorLab
898 W. Gowen Rd
Boise, ID 83705

Contact: Quality Dept.
Phone: 208-336-1643
Fax: 208-433-6160
Web: www.norlab-gas.com

Product Name: 0.0001% - 0.0999% Carbon Monoxide In Air
Revision Date: 12/8/2017
Version: 2
SDS Number: NLB 2060
Common Name: Carbon Monoxide in Air
CAS Number: Not Applicable, Gas Mixture
EPA Number: Not Applcable
RCRA Number: Not Applicable
Chemical Family: Nonflammable Gas Mixture
Synonyms: Cal Gas, 2 Part Mix
Product Use: Calibration of analyitical instrumentation

For Transportation Emergency Contact CHEMTREC 800-424-9300

2 HAZARDS IDENTIFICATION

Classification of the Substance or Mixture

GHS Classification in Accordance with 29 CFR 1910 (OSHA HCS):

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

GHS Label Elements, Including Precautionary Statements

GHS Signal Word: WARNING

GHS Hazard Pictograms:

GHS Hazard Statements:

H280 - Contains gas under pressure; may explode if heated
H333 - May be harmful if inhaled
CGA-HG24 - SUPPORTS COMBUSTION.

GHS Precautionary Statements:

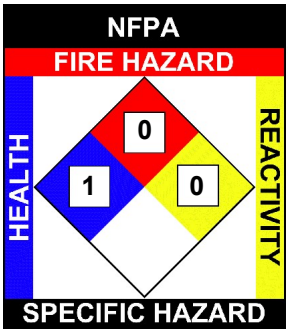
P260 - Do not breathe dust/fume/gas/mist/vapours/spray.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P412 - Do not expose to temperatures exceeding 50 °C/122 °F
P304+341 - IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52 °C (125 °F).

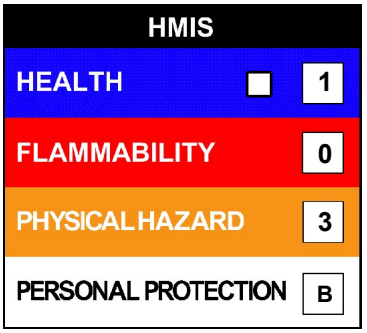
CGA-PG05 - Use a back flow preventive device in the piping.
CGA-PG06 - Close valve after each use and when empty.
CGA-PG10 - Use only with equipment rated for cylinder pressure.
CGA-PG20 - Use only equipment of compatible materials of construction.

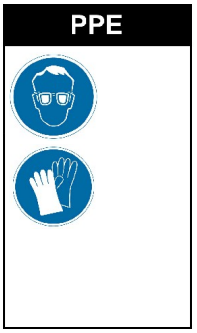
Hazards not Otherwise Classified (HNOC) or not Covered by GHS

Route of Entry:	**Inhalation**
Target Organs:	**Cardiovasuclar system, lungs, blood, central nervous system.**
Inhalation:	**This product contains up to 0.999% carbon monoxide. Inhalation of relative high concentrations of this gas may cause symptoms of carbon monoxide exposure.** **Carbon monoxide is a chemical asphyxiant. 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 concentration of carbon monoxide and duration of exposure, symptoms may include headache, dizziness, heart palpitations, weakness, confusion, nausea, and even convulsions, eventual unconsciousness and death. Lack of oxygen from carbon monoxide over exposure may produce immediate as well as delayed neurological effects. Carbon monoxide may also adversely affect fetal development.**
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 as product is a gas at room temperature.**

NFPA: **Health = 1, Fire = 0, Reactivity = 0, Specific Hazard = n/a**
HMIS III: **Health = 1, Fire = 0, Physical Hazard = 3**
HMIS PPE: **B - Safety Glasses, Gloves**







3 COMPOSITION/INFORMATION OF INGREDIENTS

Ingredients:

Cas#	%	Chemical Name
630-08-0	0.0001-0.0999%	Carbon monoxide
7782-44-7	20.9%	Oxygen
7727-37-9	69.11-79.09%	Nitrogen

20.9% Oxygen in a balance on Nitrogen indicates Air balance.

4 FIRST AID MEASURES

Inhalation: **PROMPT REMOVAL FROM THE CONTAMINATED AREA AND IMMEDIATE 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 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. 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 immediate medical attention.**

Eye Contact: **None required for gas. If frostbite is suspected, flush eyes with cool water for 15 minutes and obtain immediate medical attention.**

Ingestion: **Not anticipated, product is a gas at normal conditions**

5 FIRE FIGHTING MEASURES

Flammability:	**Not Flammable**
Flash Point:	**None**
Flash Point Method:	**None**
Burning Rate:	**Not Determined**
Autoignition Temp:	**Not Determined**
LEL:	**N/A**
UEL:	**N/A**

Nonflammable This product contains concentrations of carbon monoxide (up to 6.0%) below the LEL of 12.5% for carbon monoxide in air. This gas mixture 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:
If possible, stop the flow of gas supply. Use water spray to cool adjacent cylinders and areas well after flames are extinguished. Firefighters should wear respiratory protection (SCBA) and full turnout or Bunker gear.

6 ACCIDENTAL RELEASE MEASURES

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.

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 cylinder is secured with valve outlet piped to use point. Do no drag, slide, or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure regulator when connecting cylinder to lower pressure (, 3000 psig) 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.

Storage Requirements:

Protect cylinders from physical damage. Store in 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 deg. F (52 deg. 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. Post "NO SMOKING OR OPEN FLAMES" signs in the storage or use area.

For additional recommendations, consult Compressed Gas Association's 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. Maintain atmospheric Oxygen content at or above 19.5%**

Personal Protective Equipment:

Carbon monoxide cas#:(630-08-0) [0.0001-0.0999%]
Oxygen cas#:(7782-44-7) [20.9%]
Nitrogen cas#:(7727-37-9) [69.11-79.09%]

Personal protective equipment

Respiratory protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching gloves outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. Full contact Material: butyl-rubber Minimum layer thickness: 0.3 mm Break through time: 480 min Material tested:Butoject (KCL 897 / Aldrich Z677647, Size M)

Splash protection: Material: Chloroprene Minimum layer thickness: 0.6 mm Break through time: 30 min Material tested:Camapren (KCL 722 / Aldrich Z677493, Size M) data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374 If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an Industrial Hygienist familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Eye protection: Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection: Complete suit protecting against chemicals, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures: Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Carbon monoxide cas#:(630-08-0) [0.0001-0.0999%]

Components with workplace control parameters
Carbon monoxide 630-08-0

CEIL	200 ppm 229 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

Sampling for the carbon monoxide ceiling shall be averaged over 5 minutes but an instantaneous reading over 1500 ppm shall not be exceeded.

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

The value in mg/m3 is approximate.

TWA	25 ppm	USA. ACGIH Threshold Limit Values (TLV)

Carboxyhemoglobinemia Substances for which there is a Biological Exposure Index or Indices (see BEI section)

TWA	35 ppm 40 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

TWA	35 ppm 40 mg/m3	USA. NIOSH Recommended Exposure Limits
CEIL	200 ppm 229 mg/m3	USA. NIOSH Recommended Exposure Limits

Oxygen cas#:(7782-44-7) [20.9%]
Nitrogen cas#:(7727-37-9) [69.11-79.09%]

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	**Colorless Gas**		
Physical State:	**Gas**	**Odor:**	**Odorless**
Odor Threshold:	**Not Applicable**	**Molecular Formula:**	**CO + O2 + N2**
Particle Size:	**Not Applicable**	**Solubility:**	**Very Slight**
Viscosity:	**Not Applicable**	**Softening Point:**	**Not Applicable**
Boiling Point:	**Not Applicable**	**Freezing/Melting Pt.:**	**Not Applicable**
Flammability:	**Not Flammable**	**Flash Point:**	**Not Applicable**
		Auto-Ignition Temp:	**Not Applicable**
		UFL/LFL:	**Not Applicable**

10 STABILITY AND REACTIVITY

Chemical Stability:	**Stable**
Conditions to Avoid:	**Avoid heat, sparks, and flame.**
Materials to Avoid:	**Strong Oxidizers, bromine trifluoride, chlorine trifluoride, lithium, Potasium**
Hazardous Decomposition:	**Carbon Oxides and Nitrogen Oxides (NOx)**
Hazardous Polymerization:	**Will not occur**

11 TOXICOLOGICAL INFORMATION

Carbon monoxide cas#:(630-08-0) [0.0001-0.0999%]

Information on toxicological effects
Acute toxicity:
Oral LD50 Inhalation LC50 LC50 Inhalation - rat - 4 h - 1807 ppm
Dermal LD50 no data available
Other information on acute toxicity
Skin corrosion/irritation: no data available
Serious eye damage/eye irritation: no data available
Respiratory or skin sensitization: no data available
Germ cell mutagenicity: no data available
Carcinogenicity:
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human 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 known or anticipated 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: no data available
Teratogenicity: Known human reproductive toxicant
Specific target organ toxicity - single exposure (Globally Harmonized System):no data available
Specific target organ toxicity - repeated exposure (Globally Harmonized System):Inhalation - Causes damage to organs through prolonged or repeated exposure.
Aspiration hazard: no data available
Potential health effects: Inhalation May be harmful if inhaled. May cause respiratory tract irritation. Ingestion May be harmful if swallowed. Skin May be harmful if absorbed through skin. May cause skin irritation. Eyes May cause eye irritation.
Signs and Symptoms of Exposure: Blood disorders
Synergistic effects: no data available
Additional Information:
RTECS: FG3500000

Oxygen cas#:(7782-44-7) [20.9%]

Information on toxicological effects
Acute toxicity:
Oral LD50 no data available
Inhalation LC50
Dermal LD50
Other information on acute toxicity
Skin corrosion/irritation: no data available
Serious eye damage/eye irritation: no data available
Respiratory or skin sensitization: no data available
Germ cell mutagenicity: no data available
Carcinogenicity:
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human 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 known or anticipated 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: no data available
Teratogenicity: no data available
Specific target organ toxicity - single exposure (Globally Harmonized System):no data available
Specific target organ toxicity - repeated exposure (Globally Harmonized System):no data available
Aspiration hazard: no data available
Potential health effects: Inhalation May be harmful if inhaled. May cause respiratory tract irritation. Ingestion May be harmful if swallowed. Skin May be harmful if absorbed through skin. May cause skin irritation. Eyes May cause eye irritation.
Signs and Symptoms of Exposure: Nausea, Dizziness, Unconsciousness, May be harmful.
Synergistic effects: no data available
Additional Information:
RTECS: RS2060000

Nitrogen cas#:(7727-37-9) [69.11-79.09%]

Information on toxicological effects
Acute toxicity:
Oral LD50 no data available
Inhalation LC50
Dermal LD50
Other information on acute toxicity
Skin corrosion/irritation: no data available
Serious eye damage/eye irritation: no data available
Respiratory or skin sensitization: no data available
Germ cell mutagenicity: no data available
Carcinogenicity:
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human 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 known or anticipated 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: no data available
Teratogenicity: no data available
Specific target organ toxicity - single exposure (Globally Harmonized System):no data available
Specific target organ toxicity - repeated exposure (Globally Harmonized System):no data available
Aspiration hazard: no data available
Potential health effects: Inhalation May be harmful if inhaled. May cause respiratory tract irritation. Ingestion May be harmful if swallowed. Skin May be harmful if absorbed through skin. May cause skin irritation. Eyes May cause eye irritation.
Signs and Symptoms of Exposure: May be harmful., Nausea, Headache, Vomiting
Synergistic effects: no data available
Additional Information:
RTECS: QW9700000

12 ECOLOGICAL INFORMATION

Product does not contain Class I or Class II oxone depleting substances. Not toxic. Will not bioconcentrate.

Carbon monoxide cas#:(630-08-0) [0.0001-0.0999%]
Information on ecological effects
Toxicity: no data available
Persistence and degradability: no data available
Bioaccumulative potential: no data available
Mobility in soil: no data available
PBT and vPvB assessment: no data available
Other adverse effects: no data available

Oxygen cas#:(7782-44-7) [20.9%]
Information on ecological effects
Toxicity: no data available
Persistence and degradability: no data available
Bioaccumulative potential: no data available
Mobility in soil: no data available
PBT and vPvB assessment: no data available
Other adverse effects: no data available

Nitrogen cas#:(7727-37-9) [69.11-79.09%]
Information on ecological effects
Toxicity: no data available
Persistence and degradability: no data available
Bioaccumulative potential: no data available
Mobility in soil: no data available
PBT and vPvB assessment: no data available
Other adverse effects: no data available

13 DISPOSAL CONSIDERATIONS

Dispose of in accordance with local regulations. Do not attempt to dispose of waste or unused quantities in returnable cylinders. 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

UN1956

Proper Shipping Name US:
UN 1956, Compressed Gas N.O.S., (Carbon Monoxide, Air), 2.2

Proper Shipping Name Canada:
UN1956, Compressed Gas, N.O.S., (Carbon Monoxide, Air), 2.2

15 REGULATORY INFORMATION

Component (CAS#) [%] - CODES

Carbon monoxide (630-08-0) [0.0001-0.0999%] MASS, NJEHS, OSHAWAC, PA, PROP65, TSCA, TXAIR

Oxygen (7782-44-7) [20.9%] MASS, PA, TSCA

Nitrogen (7727-37-9) [69.11-79.09%] MASS, PA, TSCA

Regulatory CODE Descriptions

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

16 OTHER INFORMATION

Disclaimer:
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