CO 0.0001% to 0.0999%, CH4 0.0001% to 2.5%, O2 2.0% to 19.5%, in N2

1 PRODUCT AND COMPANY IDENTIFICATION

Product Identifier:	**CO 0.0001% to 0.0999%, CH4 0.0001% to 2.5%, O2 2.0% to 19.5%, in N2**
Synonyms:	**Calibration Gas**
Common Name:	**Carbon Monoxide, Methane, Oxygen, in Nitrogen**
SDS Number:	**NLB 2280**
Revision Date:	**5/29/2018**
Version:	**2**
CAS Number:	**Not Available - Gas Mixture**
EPA Number:	**Not Availble**
RCRA Number:	**Not Applicable**
Chemical Family:	**Gas Mixture**
Chemical Formula:	**CO, CH4, O2, in N2**
Product Use:	**Calibration of analyitical instrumentation**
Supplier Details:	**NorLab 898 W. Gowen Rd. Boise, ID 83705**
Contact:	**Quality Dept.**
Phone:	**208-336-1643**
Internet:	**www.norlab-gas.com**

For Transportation Emergency Contact CHEMTREC: 800-424-9300

2 HAZARDS IDENTIFICATION

Classification of Substance

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
OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.

GHS Precautionary Statements:

P202 - Do not handle until all safety precautions have been read and understood.
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray.
P271 - Use only outdoors or in a well-ventilated area.
P281 - Use personal protective equipment as required.
P304+340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P314 - Get Medical advice/attention if you feel unwell.
P403+233 - Store in a well ventilated place. Keep container tightly closed.
P410+412 - Protect from sunlight. Do not expose to temperatures exceeding 50 °C/122 °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-PG29 - Do not depend on odor to detect presence of gas.

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

CO 0.0001% to 0.0999%, CH4 0.0001% to 2.5%, O2 2.0% to 19.5%, in N2

Route of Entry: Inhalation;

Target Organs: Respiratory system;

Inhalation: This product contains carbon monoxide. Inhalation of relative high concentrations of this gas may cause symptoms of carbon monoxide exposure.

Carbon monoxide is odorless and colorless. There may be no warning of overexposure until symptoms occur. 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.

Inhalation of high methane concentrations may cause central nervous system depression with dizziness, disorientation, in-coordination, nausea, and narcosis. High concentrations may also cause cardiac sensitization resulting in irregular heartbeat and may make the individual more susceptible to cardiac effects of substances such as epinephrine and adrenaline.

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: None anticipated. Contact with rapidly expanding gas near the point of release may cause frostbite.

Ingestion: Not anticipated. Product is a gas at normal conditions.

3 COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Ingredients

CAS#	%	Chemical Name
630-08-0	0.0001-0.0999%	Carbon monoxide
74-82-8	0.0001-2.5%	Methane
7782-44-7	2.0-19.5%	Oxygen
7727-37-9	77.9001-97.9998 %	Nitrogen

4 FIRST AID MEASURES

Inhalation: PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO PRODUCT. RESCUE PERSONNEL SHOULD BE EQUIPED 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, given assisted (artificial) respiration and supplemental oxygen. The administering of 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: None Required for gas. If frostbite is suspected, flush eyes with cool water for 15 minutes and obtain immediate medical attention.

Ingestion: Not a direct hazard.

CO 0.0001% to 0.0999%, CH4 0.0001% to 2.5%, O2 2.0% to 19.5%, in N2

5 FIRE FIGHTING MEASURES

Flammability:	**Not Flammable**
Flash Point:	**None**
Flash Point Method:	**Not Applicable**
Burning Rate:	**Not Applicable**
Autoignition Temperature:	**None**
Lower Explosive Limit:	**None**
Upper Explosive Limit:	**None**

Fire and Explosion Hazards:
Nonflammable. Cylinders may rupture violently or vent rapidly from pressure when involved in a fire situation.

Extinguishing Media:
None required. Use as appropriate for surrounding materials

Fire Fighting Instructions:
Firefighters should wear respiratory protection (SCBA) and full turnout or Bunker gear. Continue to cool fire-exposed cylinders until well after flames are extinguished.

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:

Use only in well-ventilated areas. Valve protection caps must remain in place unless the cylinder 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 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 backflow into the cylinder.

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

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 asphyxiation or a toxic exposure.

Storage Requirements:

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavy traffic areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125 degrees F (52 degrees 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.

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%]
Methane cas#:(74-82-8) [0.0001-2.5%]
Oxygen cas#:(7782-44-7) [2.0-19.5%]
Nitrogen cas#:(7727-37-9) [77.9001-97.9998%]

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

CEIL 200 ppm USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
229 mg/m3
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 USA. Occupational Exposure Limits (OSHA) - Table Z- 1 Limits for Air Contaminants
55 mg/m3
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

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

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

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

Methane cas#:(74-82-8) [0.0001-2.5%]

Components with workplace control parameters

TWA 1,000 ppm USA. ACGIH Threshold Limit Values (TLV)
Central Nervous System impairment Cardiac sensitization

CO 0.0001% to 0.0999%, CH4 0.0001% to 2.5%, O2 2.0% to 19.5%, in N2

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	**Colorless Gas**		
Physical State:	**Gas**	**Odor:**	**Odorless**
Odor Threshold:	**Not Applicable**	**Molecular Formula:**	**CO, CH4, O2, in N2**
Particle Size:	**Not Applicable**	**Solubility:**	**Slightly Soluble**
Specific Gravity or Density:	**Not Applicable**	**Softening Point:**	**Not Applicable**
Viscosity:	**Not Applicable**	**Percent Volatile:**	**100%**
Saturated Vapor Concentration:	**Not Determined**	**Freezing or Melting Point:**	**Not Determined**
Boiling Point:	**Not Determined**	**Flash Point:**	**Not Applicable**
Flammability:	**Not Flammable**	**Upper Flammability Limit and Lower Flammability Limit:**	**None**

10 STABILITY AND REACTIVITY

Chemical Stability:	**Product is stable under normal conditions.**
Conditions to Avoldentification:	**Avoid open flames and high temperatures.**
Materials to Avoldentification:	**Strong oxidizing agents, Sodiium/sodium oxides, Potassium.**
Hazardous Decomposition:	**Combustion will produce carbon dioxide and, possibly toxic chemicals such as carbon monoxide.**
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

Methane cas#:(74-82-8) [0.0001-2.5%]

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: To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Synergistic effects: no data available

Additional Information:

RTECS: PA1490000

Oxygen cas#:(7782-44-7) [2.0-19.5%]

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) [77.9001-97.9998%]

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

CO 0.0001% to 0.0999%, CH4 0.0001% to 2.5%, O2 2.0% to 19.5%, in N2

12 ECOLOGICAL INFORMATION

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

Methane cas#:(74-82-8) [0.0001-2.5%]

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) [2.0-19.5%]

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) [77.9001-97.9998%]

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, Compressed gas, n.o.s., 2.2
Proper Shipping Name US:
UN 1956, Compressed Gas N.O.S., (Carbon Monoxide, Nitrogen), 2.2

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

15 REGULATORY INFORMATION

Component (CAS#) [%] - CODES

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

Methane (74-82-8) [0.0001-2.5%] MASS, NJHS, PA, TSCA, TXAIR

Oxygen (7782-44-7) [2.0-19.5%] MASS, PA, TSCA

Nitrogen (7727-37-9) [77.9001-97.9998%] MASS, PA, TSCA

WARNING This product can expose you to chemicals including Carbon monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

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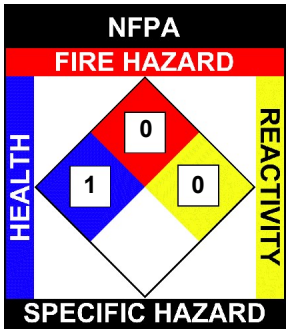
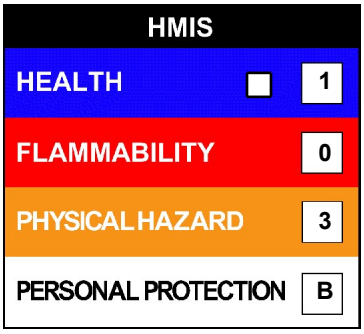
Regulatory CODE Descriptions
-----------------------------------------------------------------
MASS = MA Massachusetts Hazardous Substances List
NJEHS = NJ Extraordinarily Hazardous Substances
OSHAWAC = OSHA Workplace Air Contaminants
PA = PA Right-To-Know List of Hazardous Substances
PROP65 = CA Prop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

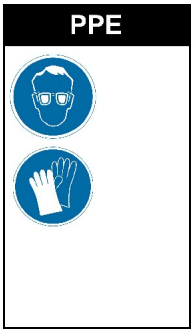
CO 0.0001% to 0.0999%, CH4 0.0001% to 2.5%, O2 2.0% to 19.5%, in N2

16	OTHER INFORMATION

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







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Revision Date: 5/29/2018