

1-300 PPM CO, 0.0001-0.75% Iso-Pentane, 2-23.5% O2 in N2

SDS Number: 2260

Revision Date: 4/26/2015

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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: 1-300 PPM CO, 0.0001-0.75% Iso-Pentane, 2-23.5% Oxygen, in Nitrogen
Revision Date: 4/26/2015
Version: 1
SDS Number: 2260
CAS Number: MIXTURE
Chemical Family: Gas Mixture
Chemical Formula: CO, C5H12, O2 in N2
Synonyms: Gas, Bump Gas, Calibration Gas Mixture, Three Part Mix
Emergency Telephone Number: (800) 424-9300 (CHEMTREC)

2 HAZARDS IDENTIFICATION

Inhalation: 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 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 for carbon monoxide.

Skin Contact: Contact with hydrogen sulfide in this product may cause severe pain itching and erythema. 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.

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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	
S		Additional Information	
t		U	
W		Y	
Z			

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

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.

Additional Hazard Statements (USA):

Simple Asphyxiate - May displace oxygen and cause rapid suffocation.

Product is a colorless, odorless non-flammable gas. 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. Mix may or may not have sufficient oxygen content to support life; therefore mix should be treated as a simple asphyxiate. Contents under pressure. Use and store below 125 °F (52 °C).

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3 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients:

CAS #	I	Percentage	I	Chemical Name
7727-37-9	I	75.72-97.9998%	I	Nitrogen
7782-44-7	I	2.0-23.5%	I	Oxygen
78-78-4	I	0.0001-0.75%	I	Iso-Pentane
630-08-0	I	0.0001-0.0300%	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. 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:** None required for gas. If frostbite is suspected, flush eyes with cool water for 15 minutes and obtain immediate medical attention.
- Ingestion:** Ingestion unlikely. Gas at room temperature.

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); 1.4% (C5H12)
- UEL:** 74.0% (CO); 7.8% (C5H12)

Extinguishing Media:

Use as appropriate for surrounding material.

Special Hazards Arising From the Substance or Mixture:

- Carbon oxides
- Nitrogen gas
- Nitrogen oxides (NOx)

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Oxygen gas

Advice for Firefighters:

Stop the flow of gas if it can be done without risk. Use water spray to cool surrounding containers. Continue to cool surrounding containers until well after 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.

The majority of this product constitutes a nonflammable inert gas. Methane and isopentane are present in concentrations below their lower Explosion limits (LEL).

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.

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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.

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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 back flow 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. 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

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alloys, low carbon stainless steels and nickel-based alloys such as Hastelloy A, B & C are recommended for higher pressure applications.

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. Post "NO SMOKING OR OPEN FLAMES" signs in the storage or use area.

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

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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 Equip: Eye/face protection:
When using material use safety goggles, gloves and vapor respirator according to HMIS PP, G. All safety equipment should be tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

Skin protection:
Handle with protective gloves made from any suitable material. Gloves must be inspected prior to use. Dispose of contaminated gloves according to applicable laws and workplace practices.

Body Protection:
Chemically resistant gloves and safety goggles are recommended. Type of protective equipment should be selected based on concentration amount and conditions of use of this material. Use safety shoes.

Respiratory protection:
A vapor respirator is not necessary but highly 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 positive pressure air line with mask and escape bottle or self-contained breathing apparatus should be available for emergency use.

Control of environmental exposure:
Prevent leakage or spillage if safe to do so.

Components with workplace control parameters:

Component(s): Nitrogen; Isopentane; Carbon Monoxide
CAS No(s): 7727-37-9; 78-78-4; 630-08-0
USA NIOSH (TWA/REL): 35.0 ppm, 40.0 mg/m³
USA NIOSH (C/REL): 200.0 ppm, 229.0 mg/m³
USA ACGIH (TWA/TLV): 25.0 ppm

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USA ACGIH (TWA/TLV): Simple asphyxiate (Nitrogen)

USA OSHA Occupational Exposure limits Table Z-1 limits for Air Contaminant (C): 55.0 ppm, 55.0 mg/m³

Biological occupational exposure limits:

Component: Carbon Monoxide

CAS-No: 74-82-8

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:	Not determined	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:	NA
Flammability:	(solid, gas): Not flammable	Octanol:	Not determined
Partition Coefficient:	Not determined	Vapor Density:	(air = 1): Not determined
Vapor Pressure:	(mm Hg @ 20 °C): Not determined	VOC:	Not determined
pH:	Not determined	Bulk Density:	NA
Evap. Rate:	Not determined	Auto-ignition Temp:	Not determined
Molecular weight:	MIXTURE	UFL/LFL:	NA
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.

11 TOXICOLOGICAL INFORMATION

Component(s): Nitrogen; Oxygen; Isopentane; Carbon Monoxide

CAS No(s): 7727-37-9; 7782-44-7; 78-78-4; 630-08-0

Acute Toxicity:

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

LC50 Inhalation - Mouse: 419 g/m³ (2 h)

Skin Corrosion/Irritation: May irritate skin.

Serious Eye Damage/Eye Irritation: May cause eye irritation.

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Respiratory or Skin Sensitation: No data available.

Germ Cell Mutagenicity: Genetic changes observed in mammalian cell assay systems at exposure of 1500 to 2500 PPM carbon monoxide 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: Known human reproductive toxicant. 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. Similar effects observed in other mammalian species.

Specific Target Organ Toxicity - Single Exposure: Narcotic effects - May cause drowsiness or dizziness.

Specific Target Organ Toxicity - Repeated Exposure: Inhalation - Causes damage to organs through prolonged or repeated exposure. Degenerative changes were observed in the brain of rats chronically exposed to 30 mg/m³ carbon monoxide.

Aspiration Hazard: No data available.

Additional Information:

Component: Nitrogen; RTECS: QW9700000

Component: Oxygen; RTECS: RS2060000

Component: Isopentane; RTECS: EK4430000

Component: Carbon monoxide; RTECS: FG3500000

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ECOLOGICAL INFORMATION

Component(s): Nitrogen; Oxygen; Isopentane; Carbon Monoxide

CAS No(s): 7727-37-9; 7782-44-7; 78-78-4; 630-08-0

Toxicity:

Toxicity to fish:

No data available. Not expected to be toxic to fish.

Toxicity to daphnia and other aquatic invertebrates:

No data available. Not expected to be toxic to daphnia and other aquatic invertebrates.

Persistence and Degradability:

No data available.

Bioaccumulative potential:

Not expected to bioaccumulate.

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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.

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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.

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TRANSPORT INFORMATION

DOT Class: Non-Flammable Gas (2.2) #2.2

UN #: UN 1956, Class: 2, Proper Shipping Name: Compressed gas, n.o.s. (Nitrogen, Carbon Monoxide)

DOT (US)

UN Number: 1956

Class: 2.2

ERG #: 126

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

IMDG

UN Number: 1956

Class: 2

EMS-No: F-C, S-V

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

IATA

UN Number: 1956

Class: 2

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

Canada TDG

UN Number: 1956

Class: 2.2

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



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15 REGULATORY INFORMATION

COMPONENT / (CAS/PERC) / CODES

*Nitrogen (7727379 75.72-97.9998%) MASS, NJHS, PA, TSCA

*Oxygen (7782447 2.0-23.5%) MASS, NJHS, PA, SARA311/312, TSCA

*Iso-Pentane (78784 0.0001-0.75%) MASS, NJHS, PA, SARA311, 312, TSCA

*Carbon monoxide (630080 0.0001-0.03%) MASS, NJEHS, OSHAWAC, PA, PROP65, SARA311/312, TSCA, TXAIR

REGULATORY KEY DESCRIPTIONS

MASS = MA Massachusetts Hazardous Substances List
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.

Preparation Information:

GHS Conversion Services
www.ghsconversionservices.com
(414) 336-2546