



Emergency Contact: Chemtrec (800) 424-9300
Or Norco (208) 336-1643

1125 West Amity Road
Boise, ID 83705
(208) 336-1643

Methane 0.0001% to 50% in Nitrogen

MATERIAL SAFETY DATA SHEET

Identification

Product Name: Methane 0.0001% to 50% in Nitrogen
Chemical Name: CH₄ in N₂
Chemical Family: Gas Mixture
CAS Number: N/A
Common Names/Synonyms: N/A
MSDS Identification Code/Number: 2130
Prepared by: Quality Dept.

Revision Date: 06/08/99
Last Review Date: 03/04/13

Composition, Information on Ingredients

Exposure Limits¹

Ingredient	% Volume	PEL-OSHA ¹	TLV-ACGIH ²	LD ₅₀ or LC ₅₀ Route/Species
Nitrogen Formula: N ₂ CAS Number: 7727-37-9 RTECS #: QW9700000	50.0 to 99.9999	Simple Asphyxiant	Simple Asphyxiant	Not Applicable
Methane Formula: CH ₄ CAS Number; 74-82-8 RTECS#: PA1490000	0.0001 to 50.0	Simple Asphyxiant	1000 PPM	Not Available

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 2007 Threshold Limit Values for Chemical Substances and Physical Agents

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

Hazard Identification

Emergency Overview:

Odorless colorless gas. Methane concentrations > 14.3% in Nitrogen are flammable and may cause fire or explosion. Keep flammable mixtures away from heat, sparks, and flames. Simple asphyxiant – This product does not contain oxygen and may cause asphyxia if released in a confined area. Maintain oxygen levels above 19.5%. Contents under pressure. Use and store below 125⁰ F (52⁰ C).

Route of Entry:

Skin Contact Yes	Skin Absorption No	Eye Contact Yes	Inhalation Yes	Ingestion No
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Health Effects:

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

Hazard Identification Continued
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Carcinogenicity: NTP: No IARC: No OSHA: No

Eye Effects:

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

Skin Effects:

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

Ingestion Effects:

None known. Ingestion is unlikely.

Inhalation Effects:

Methane and nitrogen are simple asphyxiants. Oxygen levels should be maintained at greater than 18 molar percent at normal atmospheric pressure which is equivalent to a partial pressure of 135 mm Hg. Exposure to high concentrations of this gas mixture may exclude an adequate supply of oxygen.

Effects of oxygen deficiency resulting from simple asphyxiants may include: rapid breathing, diminished mental alertness, impaired muscular coordination, faulty judgment, depression of all sensations, emotional instability, and fatigue. As asphyxiation progresses, nausea, vomiting, prostration, and loss of consciousness may result, eventually leading to convulsions, coma and death.

Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

NFPA Hazard Codes

Health: 0
 Flammability: 4 (as Methane)
 Instability: 0

HMIS Hazard Codes

Health: 0
 Flammability: 4 (as methane)
 Physical Hazard: 3

Ratings System

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

Hazard ratings were assigned in accordance with Compressed Gas Association (CGA) guidelines as published in CGA Pamphlet P-19-2004, *CGA Recommended Hazard Ratings for Compressed Gases, 2nd Edition*.

First Aid Measures

Eyes:

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

Skin:

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

Ingestion:

None required.

Inhalation:

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO THIS PRODUCT. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH 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. Keep victim warm and quiet.

Fire Fighting Measures

Fire and Explosion Hazards:

Methane is slightly lighter than air. Gas may accumulate in areas with inadequate ventilation, possibly forming an explosive atmosphere. Methane concentrations > 14.3% in nitrogen are flammable (CGA P-23, 1995). Use adequate ventilation to prevent gas buildup. Cylinders may vent rapidly or rupture violently if involved in a fire situation.

Fire Fighting Measures Continued

Conditions of Flammability: Flammable gas (for methane concentrations > 14.3% in nitrogen)		
Flash point: Not Available	Method: Not Available	Autoignition Temperature: Not Available
LEL(%): 5 (CH ₄)	UEL(%) 15 (CH ₄)	
Hazardous combustion products: Carbon Dioxide, Carbon Monoxide		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: Not Available		

Extinguishing Media:

Carbon dioxide, dry chemical or water spray.

Fire Fighting Instructions:

Use water spray to cool adjacent areas. Fire fighters should wear respiratory protection (SCBA) and full turnout or Bunker gear. Continue to cool fire-exposed cylinders until well after flames are extinguished.

For flammable mixtures:

If possible, stop the flow of gas supply. Inerting the atmosphere to reduce oxygen levels may extinguish flame, allowing capping of leaking container. Do not attempt this unless specifically trained. Reduce the rate of flow and inject an inert gas, if possible, before completely stopping the flow to prevent flashback. Do not extinguish the fire until the supply is shut off as otherwise an explosive re-ignition may occur. If the fire is extinguished and the flow of gas continues, use increased ventilation to prevent build-up of explosive atmosphere. Use non-sparking tools to close container valves.

Use water spray to cool adjacent cylinders and areas. Be cautious of a Boiling Liquid Evaporating Vapor Explosion BLEVE, if flame is impinging on surrounding containers. Direct 500 GPM water stream onto containers above liquid level with remote monitors. Limit the number of personnel in proximity of fire and evacuate surrounding areas in all directions.

Accidental Release Measures

For mixtures containing > 14.3% methane, immediately extinguish all ignition sources. No smoking, flames, flares or sparks in hazard area. 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.

Handling and Storage

Earth ground and bond all lines and equipment associated with flammable gas mixtures. All equipment should be non-sparking or explosion proof. Post "NO SMOKING OR OPEN FLAMES" signs in the storage or use area. Outside or detached storage preferred.

Gas mixture is non-corrosive and may be used with any common structural material.

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.

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.

Handling and Storage Continued

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, P-14 and Safety Bulletin SB-2.

Exposure Controls, Personal Protection

Engineering Controls:

Local exhaust to prevent accumulation of flammable concentrations and maintain air oxygen levels at or above 19.5%. Mechanical in accordance with electrical codes.

Eye/Face Protection:

Safety goggles or glasses.

Skin Protection:

Protective gloves made of any suitable material.

Respiratory Protection:

Positive pressure air line with mask and escape bottle or self-contained breathing apparatus should be available for emergency use.

Other/General Protection:

Safety shoes

Physical and Chemical Properties

Parameter	Value	Units
Physical state (gas, liquid, solid)	: Gas	
Vapor pressure	: Not Available	
Vapor density (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)	: Negligible	
Odor threshold	: Not Applicable	
Odor and appearance	: Odorless, colorless gas	

Stability and Reactivity

Stability:

Stable.

Incompatible Materials:

Oxidizers.

Hazardous Polymerization:

Will not occur.

Toxicological Information

Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

No data given in the Registry of Toxic Effects of Chemical Substances (RTECS) or Sax, Dangerous Properties of Industrial Materials, 7th ed.

Ecological Information

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

Disposal Considerations

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.

Transport Information

Parameter	United States DOT	Canada TDG
Proper Shipping name: > 14.3% Methane	Compressed gas, flammable, N.O. S., (Methane, Nitrogen)	Compressed gas, flammable, N. O. S.,
Hazard Class:	2.1	2.1
Identification Number:	UN 1954	UN 1954
Shipping Label:	Flammable Gas	Flammable Gas

Parameter	United States DOT	Canada TDG
Proper Shipping name: < 14.3% Methane	Compressed gas, N.O.S., (Methane, Nitrogen)	Compressed gas, N.O.S.,
Hazard Class:	2.2	2.2
Identification Number:	UN 1956	UN 1956
Shipping Label:	Nonflammable Gas	Nonflammable Gas

Regulatory Information

SARA Title III Notification and Information:

Methane is listed under the accident prevention provisions of section 112(r) of the Clean Air Act (CAA) with a threshold quantity (TQ) of 10,000 pounds.

SARA Title III – Hazard Classes:

Acute Health hazard
Fire Hazard
Sudden Release of Pressure Hazard

California Proposition 65: This product does not contain ingredient(s) known to the State of California to cause cancer or reproductive toxicity.

Other Information

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).



Emergency Contact: Chemtrec (800) 424-9300
Or Norco (208) 336-1643

1125 West Amity Road
Boise, ID 83705
(208) 336-1643

Carbon Dioxide 0.0001% to 30% in Nitrogen

MATERIAL SAFETY DATA SHEET

Identification

Product Name: Carbon Dioxide 0.0001% to 30% in Nitrogen
CAS Number: N/A
Chemical Family: Gas Mixture
Chemical Formula: CO₂ in N₂
Synonyms: N/A
MSDS Identification Code/Number: 2040
Prepared By: Quality Dept.

Revision Date: 03/14/01
Last Review Date: 04/10/13

Composition, Information on Ingredients

Exposure Limits¹:

INGREDIENT	% VOLUME	PEL-OSHA ²	TLV-ACGIH ³	LD ₅₀ or LC ₅₀ Route/Species
Carbon Dioxide Formula: CO ₂ CAS: 124-38-9 RTECS#: FF6400000	0.0001 to 30	5,000 ppm TWA	5,000 ppm TWA 30,000 ppm STEL	LC ₅₀ 470,000 PPM Inhalation Rat 30 Min.
Nitrogen Formula: N ₂ CAS: 7727-37-9 RTECS#: QW9700000	70.0 to 99.9999	None Established	Simple Asphyxiant	Not Applicable

¹ Refer to individual state or provincial regulations, as applicable, for limits that 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 2007 Threshold Limit Values for Chemical Substances and Physical Agents.

OSHA Regulatory Status: This material is classified as hazardous under OSHA regulations.
IDLH: 40,000 ppm (CO₂)

Hazards Identification

Emergency Overview:

Colorless, odorless, nonflammable gas. Simple Asphyxiant - This product does not contain oxygen and may cause asphyxia if released in a confined area. Maintain oxygen levels above 19.5%. Carbon dioxide exposure can cause nausea and respiratory problems. High concentrations may cause vasodilatation leading to circulatory collapse. Contents under pressure. Use and store below 125° F (52° C).

Route of Entry:

Skin Contact No	Skin Absorption No	Eye Contact No	Inhalation Yes	Ingestion No
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Hazards Identification Continued

Health Effects:

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

Carcinogenicity: NTP: No IARC: No OSHA: No

Eye Effects:

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

Skin Effects:

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

Ingestion Effects:

Ingestion is unlikely. Gas at room temperature.

Inhalation Effects:

Carbon dioxide is a cerebral vasodilator. Inhaling large concentrations causes rapid circulatory insufficiency leading to coma and death. Chronic, harmful effects are not known from repeated inhalation of low concentrations. Low concentrations of carbon dioxide cause increased respiration and headache.

Depending upon the concentration of carbon dioxide present, product may act as a simple asphyxiant. Effects of oxygen deficiency resulting from simple asphyxiants may include: rapid breathing, diminished mental alertness, impaired muscular coordination, faulty judgment, depression of all sensations, emotional instability and fatigue. As asphyxiation progresses, nausea, vomiting, prostration and loss of consciousness may result, eventually leading to convulsions, coma and death.

Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

Medical Conditions Aggravated by Exposure:

None known.

NFPA Hazard Codes

Health: 0
Flammability: 0
Instability: 0

HMIS Hazard Codes

Health: 0
Flammability: 0
Physical Hazard: 3

Ratings System

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

Hazard ratings were assigned in accordance with Compressed Gas Association (CGA) guidelines as published in CGA Pamphlet P-19-2009, *CGA Recommended Hazard Ratings for Compressed Gases, 3rd Edition*.

First Aid Measures

Eye:

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

Skin:

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

Ingestion:

Not anticipated; product is a gas.

First Aid Measures Continued

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.

Victims should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. If breathing is difficult, administer oxygen. If breathing has stopped, give artificial respiration. Keep victim warm and calm. Further treatment should be symptomatic and supportive. Seek immediate medical attention.

Fire Fighting Measures

Conditions of Flammability: Not flammable		
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. Cylinders may rupture violently from pressure when involved in a fire situation.

Extinguishing Media:

Use media suitable for surrounding combustible or flammable materials.

Fire Fighting Instructions:

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.

Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment. If a leak is in user's equipment, be certain to purge piping with an 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 Norco/NorLab location.

Handling and Storage

Electrical classification:

Non-hazardous

Use only in well-ventilated areas. Carbon dioxide vapor is heavier than air and will accumulate in low areas. Valve protection caps must remain in place on refillable cylinders unless 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 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.

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. Use a "first in-first out" inventory system to prevent full cylinders being stored for excessive periods of time.

For additional recommendations, consult Compressed Gas Association Pamphlets P-1 and Safety Bulletin SB-2.

Handling and Storage Continued

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.

Exposure Controls, Personal Protection

Engineering Controls:

Use local exhaust to prevent accumulation of high concentrations and control air contaminants to at or below acceptable exposure limits. Maintain atmospheric oxygen at or above 19.5%.

Eye/Face Protection:

Safety goggles or glasses.

Skin Protection:

Protective gloves of any material.

Respiratory Protection:

A positive pressure air line with full-face mask and escape bottle or self-contained breathing apparatus should be available for emergency use.

Other/General Protection:

Safety shoes.

Physical and Chemical Properties

PARAMETER	VALUE	UNITS
Physical state (gas, liquid, solid)	: Gas	
Vapor pressure	: Not Available	
Vapor density (Air = 1)	: ~ 1	
Evaporation point	: Not Available	
Boiling point	: Not Available	°F
	: Not Available	°C
Freezing point	: Not Available	°F
	: Not Available	°C
pH	: Not Available	
Specific gravity	: Not Available	
Oil/water partition coefficient	: Not Available	
Solubility (H ₂ O)	: Slightly Soluble	
Odor threshold	: Not Applicable	
Odor and appearance	: Colorless, odorless gas.	

Stability and Reactivity

Stability:

Stable under normal conditions.

Incompatible Materials:

None.

Hazardous Decomposition Products:

Carbonic acid in the presence of water or moisture.

Hazardous Polymerization:

Will not occur.

Toxicological Information

Inhalation:

Inhaling high concentrations of carbon dioxide may cause circulatory insufficiency leading to coma and death. Chronic, harmful effects are not known from repeated inhalation of low (3 to 5 molar %) concentrations.

Reproductive:

Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

Exposure of female rats to 60,000 ppm carbon dioxide for 24 hours has produced toxic effects to the embryo and fetus in pregnant rats. Toxic effects to the reproductive system have been observed in other mammalian species at similar concentrations.

Ecological Information

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

Disposal Considerations

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.

Transportation Information

Parameter	United States DOT	Canada TDG
Proper Shipping Name:	Compressed gas, N. O. S., (Carbon Dioxide, Nitrogen)	Compressed gas, N. O. S.
Hazard Class:	2.2	2.2
Identification Number:	UN 1956	UN 1956
Shipping Label:	Non Flammable Gas	Non Flammable Gas

Regulatory Information

SARA Title III Notifications and Information:**SARA Title III – Hazard Classes:**

Acute Health Hazard
Sudden Release of Pressure Hazard

SARA Title III- Section 313 Supplier Notification:

This product does not contain toxic chemicals subject to reporting requirements of section 313 or the Emergency Planning and Community Right-To-Know Act (EPCRA) or 1986 and of 40 CFR 372.

California Proposition 65: This product does not contain ingredient(s) known to the State of California to cause cancer or reproductive toxicity.

Other Information

Compressed gas cylinders must 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).