

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION (rev. 9-09)

Trade Number: Natural Gas (odorized)

CAS Number: 68410-63-9

Synonyms: Natural Gas (dry), Natural Gas, Methane, Pipeline Spec Gas, Processed Gas, Residue Gas, Sweet Natural Gas, Treated Gas

Use/Description: Fuel for combustion applications, raw material for chemical reactions


Corporate Physical Address	Company Mailing Address	Emergency Telephone Numbers
Piedmont Natural Gas 4720 Piedmont Row Drive Charlotte, NC 28210	Piedmont Natural Gas PO Box 33068 Charlotte, NC 28233	Safety Officer [8:00 am – 5:00 pm]: 1(704)-731-4376 CIC: 1(704) 525-3882 Gas Control [24 hour]: 1(704) 731-4253 or 1(800)-432-8420

2. COMPOSITION/INFORMATION ON INGREDIENTS (rev. 9-04)

Components	CAS No.	Mole %	Exposure Limits	
			ACGIH TLV (ppm)	OSHA PEL (ppm)
Base Gas:				
Methane	74-82-8	90.0-95%	None established by OSHA or ACGIH Simple asphyxiant; exposure limited by oxygen and flammability	
Balance Gases:				
Ethane	74-84-0	<5%	None established by OSHA or ACGIH Simple asphyxiant; exposure limited by oxygen and flammability	
Propane	74-98-6	<3%	2500 TWA	1000 TWA
Other Components	Not Applicable	<2%		

NOTE: No permissible exposure limits (PEL) or threshold limit values (TLV) exist for natural gas. The above listing is a summary of the gases in natural gas which can be found at concentrations greater than 1 mole % . Because natural gas is a natural product, composition can vary greatly.

3. HAZARDS IDENTIFICATION (rev. 9-04)

<p>EMERGENCY OVERVIEW</p> <p>DANGER!</p> <p>EXTREMELY FLAMMABLE GAS – MAY CAUSE FLASH FIRE OR EXPLOSION!!</p> <p>Keep away from heat, sparks, flames, or other sources of ignition (e.g. static electricity, pilot lights, mechanical / electrical equipment)</p>	
--	---

WARNING: This product is a simple asphyxiant. In high concentrations it will displace oxygen from the breathing atmosphere, particularly in confined spaces. Signs of asphyxiation will be noticed when oxygen is reduced to below 19.5%, and may occur in several stages. Symptoms may include rapid breathing and pulse rate, headache, dizziness, visual disturbances, mental confusion, incoordination, mood changes, muscular weakness, tremors, cyanosis, narcosis and numbness of the extremities. Unconsciousness leading to central nervous system injury and possibly death will occur when the atmospheric oxygen concentration is reduced to about 6% to 8% or less. The lower explosive limit is 3.8 to 6.5%.

WARNING: The burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

4. HEALTH HAZARDS IDENTIFICATION (rev. 9-09)

Potential Health Effects

Note: Natural gas in its gaseous state under normal conditions and at very low concentrations, does not present an inhalation, ingestion or skin hazard. At higher concentrations, natural gas will reduce the available oxygen in the air, thus resulting in symptoms of headache, nausea, dizziness, fatigue and possibly coma and / or death. In situations where natural gas is not completely combusted, carbon monoxide will accumulate which can cause an explosion hazard and a suffocation hazard.

Special note:

Using natural gas for cutting, annealing, as a chemical ingredient, or as a raw material in chemical manufacturing may cause exposure to other unknown hazards. See manufacturer of other materials for potential exposures.

Primary Route of Exposure

Natural gas is primarily inhaled. However, most often, the inhalation hazard is carbon monoxide caused by the incomplete combustion of natural gas.

EYES

Not irritating. Under most circumstances, exposure to natural gas will not affect the eyes. Use of natural gas to heat, cut, or anneal materials should require the use of at least safety glasses to insure that no foreign materials enter the eye.

SKIN

Not irritating. When natural gas is being combusted, heat is generated which may burn the skin. Under most other circumstances, exposure to natural gas will not affect the skin. Use of natural gas to heat, cut, or anneal materials may require the use of protective clothing to insure that no parts of the body are burned or foreign materials enter the skin.

INGESTION

Risk of ingestion is extremely unlikely.

INHALATION

This product is considered to be non-toxic by inhalation.

The effects of inhalation of high concentrations may cause the same effects as asphyxiation. This includes central nervous system depression such as dizziness, drowsiness, headache, and similar narcotic symptoms, but no long-term effects if removed from exposure area. Numbness, a "chilly" feeling, and vomiting have been reported from accidental exposures to high concentrations.

Carbon Monoxide poisoning can occur as a result of poor installation, poor maintenance or failure or damage to a gas appliance in service, gas is not burned properly, or when rooms are poorly ventilated and carbon monoxide is unable to escape. Carbon monoxide poisoning occurs when carbon monoxide enters the lungs via the normal breathing mechanism and displacing oxygen from the bloodstream. Interruption of

the normal supply of oxygen puts at risk the functions of the heart, brain and other vital functions of the body.

CHRONIC and CARCINOGENICITY

Methane and ethane, the main components of natural gas, are considered practically inert in terms of physiological effects. At high concentrations these materials act as simple asphyxiants and may cause death due to lack of oxygen. Incomplete combustion of natural gas creates carbon monoxide. Exposure to carbon monoxide concentrations can cause the following:

<u>Concentration of Carbon Monoxide (CO) in air</u>	<u>Inhalation time and toxic developed</u>
50 parts per million (ppm) or less	Acceptable safety level as specified by the OSHA over an eight (8) hour time weighted average.
Move people and animals from any area where the carbon monoxide level is at or above the following levels	
200 PPM	Slight headache within 2-3 hours
400 PPM	Frontal headache within 1-2 hours, becoming widespread in 3 hours
800 PPM	Dizziness, nausea, convulsions within 45 minutes, insensible in 2 hours
1200 PPM	Immediately Dangerous to Life and Health (IDLH)

CARCINOGENICITY:

OSHA: NO IARC: NO NTP: NO ACGIH: NO

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Individuals with pre-existing conditions of the heart, lungs, and blood may have increased susceptibility to symptoms of asphyxia.

5. FIRST AID MEASURES (rev. 9-04)

EYES

In case of a burn to the eye due to combustion of natural gas, cover eyes to protect from light. Seek immediate medical attention.

During cutting, annealing, or heating materials, dusts or particulates may cause mechanical irritation including pain, tearing, and redness. Scratching of the cornea can occur if eye is rubbed. Fumes may be irritating. Contact with the heated material may cause thermal burns.

SKIN

In case of burn due to combustion of natural gas, seek immediate medical attention. Contact with heated material or products of combustion may cause thermal burns.

INGESTION

Although risk of ingestion is extremely unlikely, in case of oral exposure, seek immediate medical attention.

INHALATION

If exposed to excessive amounts of natural gas due to a leak, remove person to fresh air using proper protective equipment. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. DO NOT USE ANY EQUIPMENT THAT MAY SERVE AS A SOURCE OF IGNITION UNTIL NATURAL GAS HAS COMPLETELY DISIPATED. Seek medical attention immediately.

If exposed to excessive amounts of carbon monoxide due to products of incomplete combustion, remove person to fresh air using proper protective equipment. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. DO NOT USE ANY EQUIPMENT THAT MAY SERVE AS A SOURCE OF IGNITION UNTIL CARBON MONOXIDE HAS COMPLETELY DISIPATED. Seek medical attention immediately.

6. FIRE FIGHTING MEASURES (rev. 9-04)

FLAMMABLE PROPERTIES: (NFPA Natural Gas)

FLASH POINT: Flammable gas
AUTOIGNITION POINT: 900 - 1170 °F (482 - 632 °C)
OSHA/NFPA FLAMMABILITY CLASS: FLAMMABLE GAS
LOWER EXPLOSIVE LIMIT (%): 3.8 - 6.5
UPPER EXPLOSIVE LIMIT (%): 13 - 17

FIRE AND EXPLOSION HAZARDS

Dangerous fire and explosion hazard when exposed to heat, sparks or flame. Natural gas is lighter than air and may travel long distances to a point of ignition and flash back. Containers containing or which have contained natural gas may explode in heat or fire.

EXTINGUISHING MEDIA

To extinguish a natural gas fire, stop the flow of natural gas, use dry chemical, carbon dioxide, halon or water. Special note, the fire should not be extinguished unless flow of gas can be immediately stopped.

FIRE FIGHTING INSTRUCTIONS

Gas fires should not be extinguished unless flow of gas can be immediately stopped. Shut off gas source and allow gas to burn out. If spill or leak has not ignited, determine if water spray may assist in dispersing gas or vapor to protect personnel attempting to stop leak.

Use water to cool equipment, surfaces and containers exposed to fire and excessive heat. For large fire the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure.

Isolate area, particularly around ends of storage vessels. Let vessel, tank car or container burn unless leak can be stopped. Withdraw immediately in the event of a rising sound from a venting safety device. Large fires typically require specially trained personnel and equipment to isolate and extinguish the fire.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full face piece and full protective clothing.

See Section 16 for the NFPA 704 Hazard Rating.

7. ACCIDENTAL RELEASE MEASURES (rev. 9-04)

IN CASE OF LARGE LEAK, ACTIVATE FACILITY'S EMERGENCY RESPONSE PLAN.

EVACUATE NONESSENTIAL PERSONNEL and secure all ignition sources. No road flares, smoking or flames in hazard area. Consider wind direction, stay upwind, if possible. Evaluate the direction of product travel. In case of a leak; evacuate the area and call Piedmont Natural Gas and 911.

Stop the source of the release, if safe to do so. Consider the use of water spray to disperse vapors. Isolate the area until gas has dispersed. Ventilate and test area before entering.

8. HANDLING AND STORAGE (rev. 9-09)

HANDLING and STORAGE PRECAUTIONS

Keep away from flame, sparks and excessive temperatures. Store only in approved containers. These containers must meet the requirements as specified in 49 CFR 173.302.

Containers should be bonded and ground when filling or discharging. Use only in well ventilated areas. See also applicable OSHA regulations for the handling and storage of this product, including, but not limited to, 29 CFR 1910.110 Storage and Handling of Liquefied Petroleum Gases. NOTE: Typically natural gas is handled and stored as a compressed natural gas. In these cases, the material safety data sheets (MSDS) on compressed natural gas (CNG) may prove to be more appropriate.

When storing natural gas, use explosion proof or intrinsically safe electrical equipment designed for the atmosphere in accordance with applicable codes, industrial recommended practices, and local, state and federal regulations. Do not smoke or use spark-producing tools in the area of use.

9. EXPOSURE CONTROLS AND PERSONAL PROTECTION (rev. 9-09)

WARNING: The natural gas when combusted releases products of combustion including carbon dioxide, and oxides of nitrogen. If combustion is not complete, natural gas may form excess amounts of incomplete products of combustion including carbon monoxide (CO). Where appropriate, use carbon monoxide detectors when burning natural gas to insure that all natural gas is being combusted completely. If the carbon monoxide detector alarms, discontinue use of the appliance until a Piedmont Natural Gas employee or other authorized natural gas technician can service the appliance.

ENGINEERING CONTROLS

When using gas at home or in an industrial setting, use adequate ventilation to keep gas concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces. The ventilation equipment should be explosion-proof.

When appropriate, use explosion-proof equipment and lighting in classified/controlled areas.

When using natural gas, insure that natural gas concentration has not built up prior to adding ignition source. Failure to insure that natural gas concentration has not built up may result in an explosion.

EYE/FACE PROTECTION

When lighting natural gas, use eye protection to protect from burns.

SKIN PROTECTION

Where appropriate, wear proper personal protective equipment (PPE) including flame retardant clothing to protect against burns.

RESPIRATORY PROTECTION

Use a NIOSH/MSHA approved positive-pressure, supplied air respirator with escape bottle or self-contained breathing apparatus (SCBA) for unburned natural gas concentrations above occupational exposure limits, for potential for uncontrolled release, if exposure release levels are not known, if high carbon monoxide concentration exists above fifty parts per million (50 ppm), or in an oxygen-deficient atmosphere.

HEARING

During a high-pressure release, natural gas may cause excessive noise. Hearing protection may be required for high-pressure releases of natural gas.

CAUTION: Flammability limits (i.e., explosion hazard) should be considered when assessing the need to expose personnel to concentrations requiring respiratory protection. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

10. PHYSICAL AND CHEMICAL PROPERTIES (rev. 9-04)

APPEARANCE

Colorless gas. The lack of visible gas cloud does not indicate absence of gas.

ODOR

Natural gas has a distinctive, disagreeable "natural gas" type odor when treated with an odorizing agent (typically < 0.1% ethyl mercaptan).

BASIC PHYSICAL PROPERTIES (for methane)

BOILING POINT: -259 °F (-162 °C)
VAPOR PRESSURE: 40 atm. @ -187 °F (-86 °C)
VAPOR DENSITY (air = 1): 0.6
SPECIFIC GRAVITY (H₂O = 1): 0.4 @ -263 °F (-164 °C)
SOLUBILITY (H₂O): 3.5%

11. STABILITY AND REACTIVITY (rev. 9-04)

CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS

Keep away from strong oxidizers, ignition sources and heat.

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS

Keep away from strong oxidizers. Oxidizers to avoid include bromine pentafluoride, oxygen difluoride, and nitrogen trifluoride, and hydrogen peroxide at concentrations greater than 30%.

Thermal decomposition may release toxic oxides of carbon dioxide and carbon monoxide.

Keep away from chlorine gas. Natural gas will spontaneously ignite when mixed with chlorine gas. In addition, the products of the reaction of methane and chlorine are carbon, hydrogen chloride, and various chlorocarbons. Hydrogen chloride is otherwise known as hydrochloric acid.

HAZARDOUS DECOMPOSITION PRODUCTS

Thermal decomposition may release carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

Chemical decomposition (chlorine) may release carbon and hydrogen chloride.

12. ECOLOGICAL INFORMATION (rev. 9-04)

This product is expected to exist entirely in the vapor phase in ambient air.

13. DISPOSAL CONSIDERATIONS (rev. 9-04)

Consult federal, state and local waste regulations to determine appropriate disposal methods.

14. TRANSPORTATION INFORMATION (rev. 9-04)

PROPER SHIPPING NAME: NATURAL GAS, COMPRESSED (*with high methane content*)
HAZARD CLASS: 2.1
DOT IDENTIFICATION NUMBER: UN 1971
DOT SHIPPING LABEL: FLAMMABLE GAS

CONTAINERS: AS SPECIFIED IN 49 CFR 173.302, 49 CFR 173.306 OR 49 CFR 173.318 WHERE APPLICABLE

QUANTITY LIMITATIONS: AS SPECIFIED IN THE HAZARDOUS MATERIALS TABLE LISTED IN PART 49 OF THE CODE OF FEDERAL REGULATIONS (49 CFR)

PASSENGER AIRCRAFT: FORBIDDEN

PASSENGER RAILCAR: FORBIDDEN

CARGO AIRPLANE: FORBIDDEN EXCEPT AS SPECIFIED IN THE HAZARDOUS MATERIALS TABLE LISTED IN 49 CFR.

15. REGULATORY INFORMATION (rev. 9-04)

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other regulations at the state and/or local level. Consult those regulations applicable to your facility/operation.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

This product does not contain any chemicals subject to the reporting requirements of CERCLA Section 103 or SARA 304. In addition, the CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts natural gas and synthetic gas usable for fuel and any indigenous components of such from the CERCLA Section 103 reporting requirements.

SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
		APPLIES	APPLIES	

SARA SECTION 313 - SUPPLIER NOTIFICATION

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

CANADIAN REGULATORY INFORMATION

Class A (Compressed Gas) Class B, Division 1 (Flammable Gas)

16. OTHER INFORMATION (rev. 9-04)

NFPA® 704 HAZARD RATING: HEALTH: 1 Slight
FIRE: 4 Extreme
REACTIVITY: 0 Negligible

HMIS® HAZARD RATING HEALTH: 1 Slight
FIRE: 4 Severe
REACTIVITY: 0 Minimal

SUPERSEDES MSDS DATED: none

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES AND LIABILITY

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment. Piedmont Natural Gas assumes no responsibility for injury to user or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to user or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, user assumes the risk in their use of the material.

The information in this Material Safety Data Sheet (MSDS) was obtained from sources which we believe are reliable; however, the information is provided without any representation of warranty, expressed or implied, regarding the accuracy or correctness.

The conditions or methods of handling, storage, and / or use of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with the handling, storage, and / or use of this product.