Material Safety Data Sheet

1. Chemical product and company identification

Product name	NATURAL GAS, REFRIGERATED LIQUID (CRYOGENIC LIQUID) (Refrigerated liquid at atmospheric pressure)
MSDS #	0000001593
Historic MSDS #:	None.
Code	0000001593
Product use	Fuel.
Synonyms	Liquefied natural gas (LNG)
Supplier	BP Energy Company 501 WestLake Park Boulevard Houston, TX 77079 USA
EMERGENCY HEALTH INFORMATION:	1 (800) 447-8735 Outside the US: +1 703-527-3887 (CHEMTREC)
EMERGENCY SPILL INFORMATION:	1 (800) 424-9300 CHEMTREC (USA)
OTHER PRODUCT INFORMATION	1 (866) 4 BP - MSDS (866-427-6737 Toll Free - North America) email: bpcares@bp.com

2. Composition/information on ingredients

Ingredient name	CAS #	% by weight
Natural gas, dried; petroleum gas	68410-63-9	100
Contains:		
Methane	74-82-8	85 - 100
Ethane	74-84-0	<15
Propane	74-98-6	<4.5
Butane	106-97-8	<2.5
n-Pentane	109-66-0	<2.5
Nitrogen	7727-37-9	<1.5
Carbon dioxide	124-38-9	<0.05

3. Hazards identification

Physical state	Liquefied gas (Natural gas refrigerated liquid)
Color	Colorless.
Emergency overview	DANGER!

Extremely flammable liquefied gas. Vapors may form explosive mixtures with air in confined spaces. Vapor may cause flash fire.
Inhalation causes headaches, dizziness, drowsiness, and nausea, and may lead to unconsciousness.
At very high concentrations, can displace the normal air and cause suffocation from lack of oxygen.
Extremely cold material; can cause burns similar to frostbite.

Avoid contact with skin and clothing. Do not breathe vapor or mist. Keep away from heat, sparks, flame and other sources of ignition. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

Routes of entry Absorbed through skin. Eye contact. Inhalation.

Potential health effects

Eyes Liquid can cause burns similar to frostbite. Will cause serious damage to the eyes.

Skin Liquid can cause burns similar to frostbite.

Inhalation Inhalation causes headaches, dizziness, drowsiness, and nausea, and may lead to unconsciousness. At very high concentrations, can displace the normal air and cause suffocation from lack of oxygen.

Ingestion Not applicable. Liquefied gas.

Over-exposure signs/symptoms Inhalation of vapors may cause dizziness, an irregular heartbeat, narcosis, nausea or asphyxiation.

See toxicological information (section 11)

4. First aid measures

Eye contact In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin contact Contact with liquid: Immediately flush with plenty of tepid water (105-115 F; 41-46 C). DO NOT USE HOT WATER. Get immediate medical attention.

Inhalation If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion Not applicable. Liquefied gas.

5. Fire-fighting measures

Flammability of the product Extremely flammable.

Auto-ignition temperature 540 °C (1004 °F)

Flash point -188 °C (-306 °F)

Explosion limits Lower: 5 %
Flammable Limits (% in air)

Upper: 15 %
Flammable Limits (% in air)

Products of combustion These products are carbon oxides (CO, CO_2).

Unusual fire/explosion hazards Extremely flammable in presence of open flames, sparks and static discharge or heat. Vapors may form explosive mixtures with air in confined spaces.

Flammable gas and vapor. Gas may accumulate in confined areas, travel considerable distance to source of ignition and flash back causing fire. In extreme heat containers may rupture.

Fire-fighting media and instructions

SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: In case of fire, allow gas to burn if flow cannot be shut off immediately. Do not extinguish a leaking gas flame unless leak can be stopped. Use high expansion foam to suppress flame and radiated heat from pool fire. Do not use water jet directly on liquid pool. Move containing vessels from fire if without risk. If fire can be controlled, cool container with water from unmanned hose holder or monitor nozzles until well after fire is out. Extinguish secondary fire. Handle damaged cylinders with extreme care.

Protective clothing (fire)

Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

6. Accidental release measures

Personal precautions

Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (See Section: "Exposure controls/personal protection"). Follow all fire fighting procedures (See Section: "Fire-fighting measures"). Do not touch or walk through spilled material.

Environmental precautions and clean-up methods

If emergency personnel are unavailable, contain spilled material. Stop leak if without risk. If possible, turn leaking container so that gas escapes rather than liquid. Do not direct water at spill or source. Exclude sources of ignition and ventilate the area. Water spray curtain and monitor fog/spray's to divert/dilute vapor drift.

Personal protection in case of a large spill

Move upwind and away from spill. Splash goggles. Full suit. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

7. Handling and storage

Handling

Keep away from heat, sparks and flame. Keep container closed. Do not puncture or incinerate. Use only with adequate ventilation. To avoid fire, minimize ignition sources. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material.

Storage

Outside or detached storage is preferred. Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Segregate from oxidizing materials. Avoid all possible sources of ignition (spark or flame).

8. Exposure controls/personal protection

Occupational exposure limits

Ingredient name	Occupational exposure limits
Natural gas, dried; petroleum gas	None assigned.
Contains:	
Methane	**ACGIH TLV (United States, 1/2004).** TWA: 1000 ppm 8 hour(s).
Ethane	**ACGIH TLV (United States, 1/2004).** TWA: 1000 ppm 8 hour(s).
Propane	**ACGIH TLV (United States, 1/2004).** TWA: 1000 ppm 8 hour(s). **OSHA PEL (United States, 6/1993).** TWA: 1800 mg/m^3 8 hour(s). TWA: 1000 ppm 8 hour(s).
Butane	**ACGIH TLV (United States, 1/2004).** TWA: 1000 ppm 8 hour(s).
n-Pentane	**ACGIH TLV (United States, 9/2004).** TWA: 600 ppm 8 hour(s). **OSHA PEL (United States, 6/1993).** TWA: 2950 mg/m^3 8 hour(s). TWA: 1000 ppm 8 hour(s).
Nitrogen	Simple asphyxiant.
Carbon dioxide	**ACGIH TLV (United States, 2003).**

STEL: 54000 mg/m^3 15 minute(s).
STEL: 54000 mg/m^3 15 minute(s).
STEL: 30000 ppm 15 minute(s).
TWA: 9000 mg/m^3 8 hour(s).
TWA: 5000 ppm 8 hour(s).

OSHA PEL (United States, 1993).

TWA: 5000 ppm 8 hour(s).
TWA: 9000 mg/m^3 8 hour(s).
TWA: 9000 mg/m^3 8 hour(s).
TWA: 5000 ppm 8 hour(s).

Control Measures Handle the material in a fume hood/cupboard or under local exhaust ventilation. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Hygiene measures Wash hands after handling compounds and before eating, smoking, using lavatory, and at the end of day. Approved air-supplied breathing apparatus must be worn where there is a risk of oxygen deficiency (i.e. low oxygen concentration). Ensure that eyewash stations and safety showers are close to the work-station location.

Personal protection

Eyes Wear chemical goggles and a full face shield

Skin and body Avoid contact with skin and clothing. Wear clothing and footwear that cannot be penetrated by chemicals or oil.

Respiratory Use only with adequate ventilation. Do not breathe vapor or mist. If operating conditions cause high vapor concentrations or TLV is exceeded, use NIOSH certified supplied-air respiratory.

Hands Wear suitable gloves. (Insulated gloves suitable for low temperatures)

Consult your supervisor or S.O.P. for special handling directions

Consult local authorities for acceptable exposure limits.

9. Physical and chemical properties

Physical state Liquefied gas (Natural gas refrigerated liquid)

Odor Odorless, unless odorized with ethyl mercaptan (skunky odor).

Color Colorless.

Boiling point / Range -160 °C (-256 °F)

Melting point / Range -182 °C (-295 °F)

Critical temperature -82°C (-115 °F)

Vapor Density (Air = 1) 0.55 to 0.6 (after vapor has warmed to ambient temperature)

Solubility Insoluble in cold water.

10. Stability and reactivity

Stability and reactivity The product is stable.

Conditions to avoid Keep away from sources of ignition. Keep away from heat and direct sunlight. In extreme heat containers may rupture.

Incompatibility with various substances Reactive with halogenated compounds, oxidizing agents.

Hazardous decomposition products Products of combustion: carbon oxides (CO, CO_2)

Hazardous polymerization Will not occur.

11. Toxicological information

Acute toxicity

High vapor concentrations can cause headaches, dizziness, drowsiness, and nausea, and may lead to unconsciousness. Exposure to vapor at high concentrations may have the following effects: heart beat irregularity (arrythmia).

Chronic toxicity

Carcinogenic effects

No component of this product at levels greater than 0.1% is identified as a carcinogen by ACGIH or the International Agency for Research on Cancer (IARC). No component of this product present at levels greater than 0.1% is identified as a carcinogen by the U.S. National Toxicology Program (NTP) or the U.S. Occupational Safety and Health Act (OSHA).

Mutagenic effects

No component of this product at levels greater than 0.1% is classified by established regulatory criteria as a mutagen.

Reproductive effects

No component of this product at levels greater than 0.1% is classified by established regulatory criteria as a reproductive toxin.

Teratogenic effects

No component of this product at levels greater than 0.1% is classified by established regulatory criteria as teratogenic or embryotoxic.

Other information

This material is an asphyxiant. Asphyxiants may reduce the oxygen concentration in the air to dangerous levels. Symptoms of lack of oxygen include increased depth and frequency of breathing, air hunger, dizziness, headache, nausea or loss of consciousness.

12. Ecological information

Ecotoxicity

No testing has been performed by the manufacturer.

Mobility

This product is likely to volatize rapidly into the air because of its high vapor pressure. This product is not likely to move rapidly with surface or groundwater flows because of its low water solubility of: <0.1%.

13. Disposal considerations

Waste information

Avoid contact of spilled material and runoff with soil and surface waterways. Consult an environmental professional to determine if state or federal regulations would classify spilled or contaminated materials as hazardous waste. Use only approved transporters, recyclers, treatment, storage or disposal facilities. Dispose of in accordance with all applicable local and national regulations.

Consult your local or regional authorities.

14. Transport information

International transport regulations

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	UN1972	Methane, refrigerated liquid or Natural gas, refrigerated liquid (with high methane content) (ETHANE)	2.1	Not applicable	Not determined.	-----
					Not determined.	

TDG Classification	UN1972	Methane, refrigerated liquid or Natural gas, refrigerated liquid (with high methane content) (ETHANE)	2.1	Not applicable		-----
IMDG Classification	UN1972	Methane, refrigerated liquid or Natural gas, refrigerated liquid (with high methane content) (ETHANE)	2.1	Not applicable	Not determined.	-----
IATA Classification	Not determined.	-----	Not determined.	Not determined.	Not determined.	-----

15. Regulatory information

U.S. Federal regulations

US INVENTORY (TSCA): In compliance.

This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: NATURAL GAS, REFRIGERATED LIQUID (CRYOGENIC LIQUID): Fire hazard, Immediate (Acute) Health Hazard

SARA 313

Form R - Reporting requirements

This product does not contain any hazardous ingredients at or above regulated thresholds.

Supplier notification

This product does not contain any hazardous ingredients at or above regulated thresholds.

CERCLA Sections 102a/103 Hazardous Substances (40 CFR Part 302.4):: This material is not regulated under CERCLA Sections 103 and 107.

State regulations

Massachusetts RTK:METHANE; ETHANE; Propane; Butane; n-Pentane; Nitrogen
New Jersey:METHANE; ETHANE; Propane; Butane; n-Pentane; Nitrogen
Pennsylvania RTK:METHANE (generic environmental hazard); ETHANE (generic environmental hazard); Propane (generic environmental hazard); Butane (generic environmental hazard); n-Pentane (generic environmental hazard); Nitrogen (generic environmental hazard)

Inventories

AUSTRALIAN INVENTORY (AICS): In compliance.

CANADA INVENTORY (DSL): In compliance.

CHINA INVENTORY (IECS): Not determined.

EC INVENTORY (EINECS): In compliance.

JAPAN INVENTORY (ENCS): Not determined.

KOREA INVENTORY (ECL): In compliance.

PHILIPPINE INVENTORY (PICCS): Not determined.

16. Other information

Label requirements

DANGER!

Extremely flammable liquefied gas. Vapors may form explosive mixtures with air in confined spaces. Vapor may cause flash fire.
Inhalation causes headaches, dizziness, drowsiness, and nausea, and may lead to unconsciousness.
At very high concentrations, can displace the normal air and cause suffocation from lack of oxygen.
Extremely cold material; can cause burns similar to frostbite.

HMIS® Rating :

Health	**2**
Flammability	**4**
Physical Hazard	**0**
Personal protection	**X**

National Fire Protection Association (U.S.A.)

History

Date of issue 05/13/2005.

Date of previous issue 05/11/2005.

Prepared by Product Stewardship

Notice to reader

NOTICE : This Material Safety Data Sheet is based upon data considered to be accurate at the time of its preparation. Despite our efforts, it may not be up to date or applicable to the circumstances of any particular case. We are not responsible for any damage or injury resulting from abnormal use, from any failure to follow appropriate practices or from hazards inherent in the nature of the product.