



LNG EXPRESS INDIA PVT. LTD, WAGHODIA
MATERIAL SAFETY DATA SHEET
LIQUIDIFIED NATURAL GAS (LNG)

1. CHEMICAL PRODUCT :

NFPA HAZARD RATING:

| | |
|-----------|---|
| HEALTH: | 1 |
| FIRE: | 4 |
| ACTIVITY: | 0 |
| OTHER: | - |

EMERGENCY TELEPHONE: POLICE – 100, FIREBRIGADE : 101, LEIPL - 02652662288

ADDRESS: LNG Express India Pvt. Ltd.
A-36 Ghanshyam Nagar Society - 2, GIDC
Road Manjalpur, Vadodara - 390 011

CHEMICAL FAMILY: Complex mixture of Petroleum hydrocarbons.

CHEMICAL FORMULA: CH₄ (Methane)

SYNONYMS: Liquefied Natural Gas (LNG), Refrigerated Methane,
Dry Natural Gas, Compressed Natural Gas (CNG).

2. CHEMICAL AND INFORMATION ON INGREDIENTS :

| Sr. No. | Components | Mole % (Approx.) |
|---------|-------------------------------------|------------------|
| 1 | Methane (C1) | 85.0 Minimum |
| 2 | Ethane (C2) | 9.2 Max. |
| 3 | Propane (C3) | 3.0 Max. |
| 4 | Butane (C4) | 2.0 Max. |
| 5 | Pentane (C5) | 0.25 Max. |
| 6 | Nitrogen | 1.25 Max. |
| 7 | Hydrogen Sulfide (H ₂ S) | 6 PPM |
| 8 | Sulfur | 10 PPM |

A complex mixture of light gases separated from raw natural gas consisting of aliphatic hydrocarbons having carbon numbers in the range of C1 through C4 predominately methane (C1) and ethane (C2). Gas may be odorized with trace amounts of odorant (typically well below 0.1% with t - butyl mercaptan).

3. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: A colorless gas. Cold vapor cloud may be white but the lack of visible gas cloud does not indicate absence of gas. A colorless liquid under pressure.

ODOR: Odorless when pure, but may have a “natural gas” type odor when treated with odorizing agent (usually t-butyl mercaptan).



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PHYSICAL AND CHEMICAL PROPERTIES:

| | |
|-------------------------------|------------------------------|
| Colour: | Colourless. |
| Odour: | Odourless |
| Freezing Point (°C): | -182.5 |
| Boiling Point (°C): | -161.5 |
| Flash Point (°C): | -187.8 |
| Evaporation Rate: | Rapid |
| Flammability (solid, gas): | Flammable gas |
| Lower Explosion Limit: | 5% (by volume, gas phase) |
| Upper Explosion Limit: | 15% (by volume, gas phase) |
| Vapour Density: | >1 @ -112 degrees C(Air = 1) |
| Specific Gravity: | 0.45 (water = 1) |
| Solubility in water (20°C): | 24.4 parts per millions (wt) |
| Auto-ignition Temperature: | 537 °C (Gas Phase) |
| Percent Volatile (by volume): | 99% |
| Density (Gram/Liter): | 450 at boiling point |

4. HAZARDS:

PRIMARY ROUTES OF EXPOSURE: Eye and Skin contact, acute inhalation.

EYES: Vapors are not irritating. However, contact with liquid or cold vapor may cause frostbite, freeze burns, and permanent eye damage.

SKIN: Vapors are not irritating. Direct contact to the skin or mucous membrane with liquefied product or cold vapor may cause freeze burns and frostbite. Signs of frostbite include a change in the color of skin to gray or white, possibly followed by blistering. Skin may become inflamed and painful.

INGESTION: Ingestion is unlikely. Contact of the mucous membranes with liquefied product may cause frostbite or freeze burns.

INHALATION: This product is considered to be non-toxic by inhalation. Inhalation of high concentrations may cause central nervous system depression such as dizziness, drowsiness, headache, and similar narcotic symptoms, but no long term effects. Numbness, a “chilly” feeling, and vomiting have been reported from accidental exposure to high concentrations.

This product is a simple asphyxiant. In high concentrations, it will displace oxygen from the breathing atmosphere, particularly confined spaces. Signs of asphyxiation will be noticed when oxygen is reduced to below 16%, and may occur in several stages. Symptoms may include rapid breathing and pulse rate, headache, dizziness, visual disturbances, mental confusion, in coordination, mood changes, muscular weakness, tremors, cyanosis, narcosis and numbness of the extremities. Unconsciousness leading to central nervous system injury and possibly death will occur with inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.



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

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

EYES: In case of frostbite or freeze burns, gently soak the eyes with cool to lukewarm water. DO NOT WASH THE EYES WITH HOT WATER. Open eyelids wide to allow liquid to evaporate. If the person cannot tolerate light, protect the eyes with a bandage or handkerchief. Do not introduce ointment into the eyes without medical advice. Seek immediate medical treatment.

SKIN: Remove contaminated clothing and flush affected area with cool to lukewarm water. Re-warming the exposed area may be performed, however DO NOT USE HOT WATER. Seek immediate attention if blistering, tissue freezing, or frostbite has occurred.

INGESTION: DO NOT INDUCE VOMITING BECAUSE OF DANGER OF BREATHING LIQUID INTO LUNGS. Seek immediate medical attention. Rinse mouth with water. Administer 1 to 2 glasses of water or milk to drink. Never administer liquids to an unconscious person.

INHALATION: Remove person to fresh air. If the person is not breathing, give artificial respiration. If breathing is difficult, give oxygen. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

6. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS

Liquid releases of flammable vapors at well below ambient temperatures readily form a flammable mixture with air. Dangerous fire and explosion hazard when exposed to heat, sparks, or flame. Vapors are heavier than air up to - 112 Deg C and may travel long distances to a point of ignition or flashback. Container may explode in heat or fire.

EXTINGUISHING MEDIA

Dry chemical, carbon dioxide, halon, or water: Class C, B, or A extinguisher, respectively. However, 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 the 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



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further minimize personnel exposure. Isolate the area, particularly around the ends of the storage vessel. Let vessel, tank car, or container burn unless leak can be stopped. Withdraw immediately in the event of a rising sound from the venting of a safety device. Large fires typically require self-contained breathing apparatus with full face piece and full protective clothing.

7. ACCIDENTAL RELEASE MEASURE

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible to evaluate the direction of product travel. Vapor cloud may be white, but color will dissipate as cloud disperses - fire and explosion hazard is still present. Stop the source of the release, if safe to do so. Do not flush down sewer or drainage systems. Do not touch spilled liquid (frostbite or freeze burn hazard!). Consider the use of water spray to disperse vapors. Isolate the area until gas has dispersed. Ventilate and gas test area before entering.

8. HANDLING AND STORAGE PRECAUTIONS

Keep away from flame, sparks, and excessive temperatures.

HANDLING: To be handled by trained personnel only. using equipment specifically designed for LNG and following approved operating procedures.

STORAGE: Store only in approved vessels designed for LNG storage, and follow approved operating procedures.

9. EXPOSURE CONTROLS AND PERSONAL PROTECTION

ENGINEERING CONTROLS: Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces. Use explosion-proof equipment and lighting in classified/controlled areas.

EYE/FACE PROTECTION: Where there is a possibility of liquid contact, wear splash proof SAFETY goggles and face shield.

SKIN PROTECTION: When contact with liquid may occur, wear apron, face shield, and cold-impervious insulating gloves.

RESPIRATORY PROTECTION

Use an approved positive-pressure, supplied air respirator with escape bottle or self-contained breathing apparatus (SCBA) for gas concentrations above occupational exposure limits, for potential uncontrolled release, if exposure levels are not known, or in an oxygen-deficient atmosphere.

Caution: Flammability limits (i.e. - explosion hazard) should be considered when assessing the need to expose personnel to concentrations requiring respiratory protection selection.



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10. STABILITY AND REACTIVITY

STABILITY: Stable

CONDITIONS TO AVOID: Keep away from ignition sources and heat, high temperatures, open flames, sparks, welding, smoking, static electricity, and other ignition sources.

INCOMPATIBLE MATERIALS: Keep away from strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide, and noncombustible hydrocarbons (smoke).

11. TOXICOLOGICAL PROPERTIES : LD 50: Not available, LC 50: Not available.

12. ECOLOGICAL INFORMATION

Liquid release is only expected to cause localized, non-persistent environmental damage, such as freezing. Biodegradation of this product may occur in soil and water. Volatilization is expected to exist entirely in the vapor phase in ambient air.

13. DISPOSAL CONSIDERATIONS

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container or allow to vapourize and dispose to the atmosphere.

14. TRANSPORTATION INFORMATION

Shipping Name: Natural Gas Refrigerated Liquid (Cryogenic liquid with high methane content)

Hazard Class: 2.1

Dot Identification Number: UN1972

Dot Shipping Label: Flammable Gas

15. REGULATORY INFORMATION

Any accident of LNG Tanker should be reported to local Police and to Chief controller of Explosives, Nagpur (India).

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