


1. IDENTIFICATION: PRODUCT IDENTIFIER AND CHEMICAL IDENTITY

Product Name	LNG
Proper Shipping Name	NATURAL GAS, REFRIGERATED LIQUID with high methane content
Other Names	Liquefied Natural Gas
Recommended Use	Fuel
Supplier Name	EVOL LNG
	Wesfarmers LNG Pty Ltd (ABN 66 096 080 205)
Address	Building 161, Car Park 12, Murdoch University Murdoch, Western Australia, 6150
Telephone No.	13 21 80
Website	www.evollng.com.au
Australian Emergency Contact No.	1800 093 336 (24 hours, 7 days)

2. HAZARDS IDENTIFICATION

GHS Classification

Physical Hazards
Flammable Gas – Category 1 Refrigerated Liquefied Gas
Hazard Statements
DANGER – Extremely Flammable Gas Contains refrigerated gas; may cause cryogenic burns or injury
Precautionary Statements
No Smoking. Keep away from heat, sparks, open flames and hot surfaces. Store in a well-ventilated place. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. Wear cold insulating gloves and eye protection. Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical attention.



Safety Data Sheet - LNG

3. COMPOSITION AND INFORMATION ON INGREDIENTS

LNG supplied by Evol LNG has typical composition as below.

Chemical Identity of Ingredient	Proportion (Mole %)	CAS Number
Methane (CH ₄)	> 90 %	74-82-8
Ethane (C ₂ H ₆)	1 - 5 %	74-84-0
Nitrogen (N ₂)	1 - 5 %	7727-37-9

4. FIRST AID MEASURES

Inhalation Move patient to fresh air.
Administer high flow oxygen and assist ventilation as required.
If difficulty breathing persists or oxygen has been administered, seek medical attention.

Skin Contact

Cryogenic burns and Frostbite - Minor Injuries:

Ensure that clothing around the affected area is loose and does not restrict blood flow.
Do not attempt to remove clothing which has frozen onto the skin until flushing has allowed it to thaw completely.

Gently flush or immerse the affected areas with lukewarm water (30°C) for at least 15 minutes or longer as required for skin colour to change from waxy white / pale yellow through blue to pink or red.

Apply non-stick sterile dressing and treat as for a thermal burn.

DO NOT use hot water or apply any form of direct heat.

DO NOT RUB.

Seek immediate medical attention if the burn is large, blistered or deep, or if tissue freezing or frostbite has occurred.

Cryogenic burns and Frostbite - Major Injuries:

Send for Ambulance.

Follow minor injury procedure as far as possible.

Manage for shock.

Eye Contact Treatment for cold burns: Immediately flush with lukewarm water or with sterile saline solution. Hold eyelids apart and irrigate for at least 15 minutes.

Seek immediate medical attention.

Ingestion Due to product form and application, ingestion is considered extremely unlikely.

Symptoms caused by exposure

Direct contact with eyes or skin may cause severe frostbite.

Symptoms of exposure are directly related to displacement of oxygen from air.

As the amount of oxygen inhaled is reduced from 21 - 14% volume, the pulse rate will accelerate and the rate and volume of breathing will increase. The ability to maintain attention and think clearly is diminished, muscular co-ordination is somewhat disturbed.

As oxygen decreases from 14 - 10% volume, judgement becomes faulty, severe injuries may cause no pain. Muscular effort will lead to rapid fatigue.

Further reduction to 6% may cause nausea and vomiting. Ability to move may be lost. Permanent brain damage may result even after resuscitation from exposure to this low level of oxygen.

Below 6% breathing is in gasps and convulsions may occur.

Inhalation of a mixture containing no oxygen may result in unconsciousness from the first breath and death will follow in minutes.



Safety Data Sheet - LNG

Medical attention and special treatment

Treatment is symptomatic and supportive.

5. FIREFIGHTING MEASURES

Suitable extinguishing equipment

Isolation is the preferred method of extinguishment. Do not attempt to extinguish but stop gas flow at the source if safe to do so and allow to burn out.

Evacuate area and contact emergency services.

High expansion foam is recommended for fire fighting suppression.

Water may be used to assist with cooling of cylinders and to disperse vapours.

Caution: Do not use water near electrical items.

Do not spray water or foam onto spilled pools of LNG as the fire water will heat the cryogenic liquid and result in a larger vapour cloud

Specific hazards

Highly flammable.

Natural gas fires create intense radiant heat.

Heating to decomposition produces acrid smoke and irritating fumes.

May also evolve carbon oxides when heated to decomposition.

Product will add fuel to a fire.

Temperatures in a fire may cause pressure relief devices to be activated and cylinders to rupture.

Special protective equipment and precautions for fire fighters

Evacuate area and contact emergency services.

Liquid leaks generate large volumes of flammable vapour which is heavier than air when first released and may collect in low lying areas and travel downwind and/or downhill to sources of ignition. As the vapour warms it becomes less dense than air and will dissipate upwards. The vapour can then travel trapped beneath overhead structures.

The explosive zone may extend beyond the limits of the visible vapour cloud.

Remain upwind and notify those downwind of hazard.

Breathing apparatus is required in confined spaces.

Do not approach vessels suspected of being hot.

Immediately withdraw from fire area if vessel venting noise begins to cycle or the container becomes distorted.

Pressure relief valves from exposed cylinders may operate which will increase fire in localised areas.

Use water mist to cool intact containers and nearby storage areas.

Cooling fire water spray may need to be used on exposures, due to high radiant heat from an LNG fire.

Do not spray water or foam onto spilled pools of LNG.

Hazchem Code

2YE

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Wear long sleeves and trousers made of non-static producing fibres and close fitting safety glasses with side shields. Wear liquid impervious, thermally insulating gloves if contact with liquid is a possibility.

LNG will ignite easily under all normal Australian weather conditions.

Any spillage or leak creates a severe fire and/or explosion hazard.

Liquid leaks generate large volumes of flammable vapour which is heavier than air when first released and may collect in low lying areas and travel downwind and/or downhill to sources of ignition. As the vapour warms it becomes less dense than air and will dissipate upwards. The vapour can then travel trapped beneath overhead structures.

The explosive zone may extend beyond the limits of the visible vapour cloud.

Vapour may collect in any confined space.

If a leak has not ignited:

- Evacuate the area of all unnecessary personnel
- Eliminate all sources of ignition.
- Stop the gas flow at the source if safe to do so.
- Do not enter a vapour cloud except for rescue; self-contained breathing apparatus must be worn.

Environmental precautions

LNG will evaporate rapidly on release.

It is unlikely to contaminate soil or waterways.

Methods and materials for containment and cleaning up

Isolate immediate area from pedestrian and vehicle traffic.

Eliminate other sources of ignition.

Monitor visible vapour cloud.

The absence of a visible vapour cloud does not mean that an explosive atmosphere is not present.

Consider alerting personnel downwind of hazard to evacuate and eliminate sources of ignition.

Contact emergency services and supplier.

Approach from upwind.

Isolate and shut off fuel where able.

Use water sprays to disperse vapours.

Do not spray water or foam onto spilled pools of LNG.

The liquid and vapour are highly flammable and precautions should be taken to prevent ignition until the vapours have dissipated.

After it is believed that the vapours have dissipated, gas test the area before entering to ensure that the area is safe.

7. HANDLING AND STORAGE

Precautions for safe handling

Risk of RPT (Rapid Phase Transition): A significant difference in temperature between LNG and a warmer liquid may cause almost instantaneous vaporisation of the LNG. The sudden increase in total volume occupied by the LNG may generate a 'cold explosion' shock wave (sudden generation of overpressure but without combustion).

Eliminate all ignition sources including cigarettes, open flames, spark producing switches/tools, heaters, naked lights, pilot lights, vehicles and mobile phones.

Where appropriate ensure equipment is electrically bonded and earthed to prevent static accumulation.

Use safe work practices to avoid eye or skin contact and inhalation.

Observe good personal hygiene, including washing hands before eating.

Conditions for safe storage

The Australian Standard AS 3961-2005; The Storage and Handling of Liquefied Natural Gas details the requirements for safe storage and handling of LNG.

In Western Australia storage must conform to the Dangerous Goods Safety Act 2004 and relevant Regulations under the Act.

Refer to local regulations for other states - see Section 15 Regulatory Information.

Store in a well-ventilated area away from oxidising agents (eg pool chlorine), acids, alkalis, direct sunlight, heat or ignition sources and protected from physical damage.

Store and use only in vessels designed for use with this product.

Check regularly for leaks.

Large storage areas should be bunded and have appropriate fire protection and ventilation systems.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure control measures

Workplace Exposure Standards

Name	CAS	TWA
Ethane	74-84-0	Simple asphyxiant - may present an explosion hazard
Methane	74-82-8	Simple asphyxiant - may present an explosion hazard
Nitrogen	7727-37-9	Simple asphyxiant

Engineering controls

Do not inhale vapours.

Use in well ventilated areas.

In poorly ventilated areas, mechanical explosion proof extraction ventilation is recommended

Individual protection measures

Eye and face protection

Wear close fitting safety glasses with side protection.

Where contact with liquid is possible double eye protection such as safety glasses or goggles and a face shield is recommended.

Skin protection

Wear long sleeves and trousers or overalls made from specifically designed non-static producing or natural fibres when handling LNG.

Wear liquid impervious, thermally insulating gloves when handling liquid or transfer hoses and connections. Aprons and gauntlets may also be appropriate in these situations.

Insulating gloves should also be worn where contact with pipework chilled by vaporising liquid is a possibility.

Respiratory protection

In the event that personnel are required to work in areas where vapour concentration presents an asphyxiation risk, supplied air respirators or self-contained breathing apparatus should be used.

Ensure that personnel are suitably trained in the use of the equipment and that all manufacturers' instructions are adhered to.

The possibility of an explosive atmosphere should be considered when assessing the need for personnel to enter areas where respiratory protection is required.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Clear, colourless liquid at supply temperature. Colourless gas at ambient temperature.
Odour	Odourless
Odour threshold	Not detectible by smell
pH	Not applicable.
Freezing point	-183°C
Initial boiling point	-161°C
Boiling range	-161°C to -88°C
Flash point	-188°C
Evaporation rate	Not Available (Rapid)
Flammability	Extremely flammable
Upper explosive limit	14.8 vol% in air
Lower explosive limit	4.6 vol% in air
Vapour pressure	34,000 kPa (absolute) @ 40°C
Liquid Density	0.308 kg/l @ 15°C (0.414 kg/l @ -146.8°C and 250 kPag)
Vapour density	0.694 kg/m ³ @ 15°C (1.6 kg/ m ³ @ -146°C)
Relative vapour density	0.567 @ 15°C (relative to air)
Solubility	very low; < 60 mg/l in water Soluble in ethanol and hydrocarbons
Partition coefficient: n-octanol/water	log Kow = 1.09 (Methane)
Auto-ignition temperature	537°C (Methane)
Decomposition temperature	Not available

10. STABILITY AND REACTIVITY

Reactivity Extremely flammable liquid and vapour.
Reacts violently with oxidising agents, oxygen, halogens and metal halides

Chemical stability
LNG is stable under recommended conditions of storage.

Conditions to avoid
Avoid heat, sparks, open flames and other ignition sources

Incompatible materials
LNG is incompatible with oxidising agents, acids, heat and ignition sources.
It is also incompatible with oxygen, halogens and metal halides.
Do not use natural rubber flexible hoses.

Decomposition Products
Heating to decomposition produces acrid smoke and irritating fumes.
May also evolve carbon oxides when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Non-toxic – simple asphyxiant.
Effects are proportional to oxygen displacement.
No LD50 data available for components of this product.

Skin corrosion/irritation

Vapour is non-irritating.
Contact with liquid, cold vessels or pipes containing low pressure liquid, may result in cold burns or frost-bite with severe tissue damage

Serious eye damage/irritation

Vapour is non-irritating.
Contact with liquid may result in severe cold burns with possible permanent damage.

Respiratory or skin sensitisation

Not known to cause sensitization.

Germ cell mutagenicity

Not known to cause germ cell mutations.

Carcinogenicity

Components not listed by the International Agency for Research on Cancer (IARC).

Reproductive toxicity

Not known to cause reproductive toxicity.

Specific Target Organ Toxicity (STOT) – single exposure

Non-toxic – simple asphyxiant.

Specific Target Organ Toxicity (STOT) – repeated exposure

Non-toxic – simple asphyxiant.

Aspiration hazard

Not an aspiration hazard.

12. ECOLOGICAL INFORMATION

Ecotoxicity LNG is not expected to be toxic to the environment.

Persistence and degradability

LNG will be in the vapour phase at normal atmospheric conditions. Ethane is degraded in the atmosphere by photochemically-produced hydroxyl radicals. Methane degrades very slowly in the atmosphere by reaction with photochemically-produced hydroxyl radicals. The half-life of this reaction is 6 years.

Bioaccumulative potential

The potential for LNG to bioaccumulate is low.

Mobility in soil

LNG is not expected to remain in soil; it will evaporate rapidly and completely to atmosphere.

Other adverse effects

Liquid spills of LNG are likely to cause frost damage to vegetation.
LNG contains more than 80% methane which is a greenhouse gas.

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Any unused product and storage vessels should be returned to the supplier when no longer required.

14. TRANSPORT INFORMATION

UN number	1972
Proper shipping name	NATURAL GAS, REFRIGERATED LIQUID with high methane content
Transport hazard class	Class 2.1, Flammable gas
Packing Group	None Allocated

Environmental hazards for Transport Purposes

No specific considerations; see Section 6.

Special Precautions for user

Do not transport with chemicals of class;
1 (Explosives),
3 (Flammable liquids),
4.1 (Flammable solids),
4.2 (Spontaneously combustibles),
4.3 (Dangerous when wet),
5.1 (Oxidising agents),
5.2 (Organic Peroxides),
7 (Radioactives) and foodstuffs.

Additional Information

Transport of LNG is controlled in accordance with the requirements of the Australian Dangerous Goods Code.

See Section 15 for further information on transport legislation.

Hazchem Code	2YE
---------------------	-----

15. REGULATORY INFORMATION

Safety, health and environmental regulations

Storage and Transport is subject to state based legislation. The applicable legislation in Western Australia is the Dangerous Goods Safety Act 2004 and relevant regulations under the Act.

Not classified using the criteria in the Standard Uniform Scheduling of Drugs and Poisons in the Poisons Standard 2012.

Individual components are listed as High Volume Industrial Chemicals in the Australian Inventory of Chemical Substances under the Industrial Chemicals (Notification and Assessment) Act 1989 (Commonwealth), but not the mixture. Methane and Ethane are listed as Hazardous Substances.

16. OTHER INFORMATION

1. To the best of our knowledge this document complies with the Code of Practice for the Preparation of Safety Data Sheets for Hazardous Chemicals, Safe Work Australia.
2. This Safety Data Sheet summarises our best knowledge of the health and safety hazard information of the product and how to safely handle and use the product in the workplace. Each user should read this Safety Data Sheet and consider the information in the context of how the product will be handled and used in the workplace, including in conjunction with other products.
3. If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact the Wesfarmers Chemicals, Energy and Fertilisers (WesCEF) Health, Safety and Environment Department by calling the switchboard on (08) 9312 9222 during normal business hours. In the event of an emergency please contact 1800 093 336.
4. Kleenheat reserves the right to make change to safety data sheets without notice.

References

Preparation of Safety Data Sheets for Hazardous Chemicals – Code of Practice, Safe Work Australia
<https://www.safeworkaustralia.gov.au/doc/model-code-practice-preparation-safety-data-sheets-hazardous-chemicals>

Globally Harmonized System of Classification and Labelling of Chemicals (GHS), 3rd revised edition, United Nations, 2009, https://www.unece.org/trans/danger/publi/ghs/ghs_rev03/03files_e.html

Hazardous Chemical Information System (HCIS), <http://hcis.safeworkaustralia.gov.au>

Hazardous Substances Data Bank (HSDB), <https://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>

Australian Dangerous Goods Transport code – 7th Edition

END OF SDS

Document Revision Table		
Version	Details	Publication Date
7.0	Full Review	Sep 2018
6.0	Minor changes to first aid section and composition. Removed information related to interstate supply	Mar 2017
5.0	Logo update, Supplier name updated.	Jan 2016
4.0	Page footer modified.	Jun 2014
3.0	Hazchem code changed from 2WE to 2YE.	Jun 2014
2.0	Major review. Renamed, reformatted and updated to 2011 Code of Practice and GHS.	Sep 2013
1.0	Initial release of document	Apr 2012