



CALOR

Safety Data Sheet – Liquefied Natural Gas (LNG)

According to EC 1907/2006

Section 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Name:	Liquefied Natural Gas
Other means of identification:	LNG; Liquid Methane
Safety Data Sheet Number:	CG-SDS-001
REACH Registration Number:	Exempt from REACH registration (Regulation EC 1907/2006)

1.2 Relevant identified uses of the substance or mixture and uses advised against

Intended Use:	Industrial and professional use, Fuel, industrial feedstock, power generation and vehicle transportation. Perform risk assessment prior to use.
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Uses Advised Against:	All others
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1.3 Details of the supplier of the substance or mixture

Supplier:	Calor Teoranta, Long Mile Road, Dublin 12.
Republic of Ireland:	Calor Gas Northern Ireland Limited, Airport Road West,
Northern Ireland:	Sydenham, Belfast BT3 9EE.
SDS Information:	URL: www.calorgas.ie
	Email: sds@calorgas.ie

1.4 Emergency telephone number

Republic of Ireland	+353 (0)1 2916229
Northern Ireland	+44 (0)8450 755588

Section 2: Hazards Identification

2.1 Classification of the substance or mixture

CLP Classification (EC No 1272/2008)

H220 – Extremely Flammable gas
H224 - Extremely Flammable liquid and vapour
H281 -- Contains refrigerated gas; may cause cryogenic burns or injury

Superseded DSD Classification (67/548/EEC and 1999/45/EC):

F+ ; R12

2.2 Label Elements

Labelling Pictograms according to Regulation (EC) No 1272/2008

EC No. 232-343-9



Signal Word

DANGER

Hazard Statements

H220 -- Extremely Flammable gas

H224 - Extremely Flammable liquid and vapour

H281 -- Contains refrigerated gas; may cause cryogenic burns or injury

Precautionary Statements

P202 - Do not handle until all safety precautions have been read and understood.

P210 - Keep away from heat/sparks/open flames/hot surfaces and other ignition sources including internal combustion engines
— No smoking.

P222- Use only non-sparking tools

P243 – Take action to prevent static discharge, including static discharge from mobile phones and other electronic devices

P282 - Wear cold insulating gloves and either face shield or eye protection.

P315 - If exposed to liquid seek immediate medical attention

P336+P315 - Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.

P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381 - Eliminate all ignition sources if safe to do so.

P403 - Store in a well-ventilated place

2.3 Other hazards

Contact with liquid may cause cold burns/frost bite.

High concentrations of LNG vapours may displace oxygen, especially in a confined space

LNG and its vapours do not exhibit the characteristics of natural gas

Containers of LNG are typically under pressure and temperature controlled conditions, the containers may explode if heated or if temperature control is not maintained.

Section 3: Composition / Information on Ingredients

Calor LNG is predominantly methane but has a variable composition depending on source of supply. The range below are indicative of the product supplied by Calor.

Chemical Identity	Chemical Formula	Proportion (mol %)	CAS Number
Methane	CH ₄	80-100	74-82-8
Ethane	C ₂ H ₆	0-11	74-84-0
Propane	C ₃ H ₈	0-7	74-98-6
N-Butane	C ₄ H ₁₀	0-4	106-97-8

Iso-Butane	C ₄ H ₁₀	0-4	75-28-5
N-Pentane	C ₅ H ₁₂	0-2	109-66-0
Iso-Pentane	C ₅ H ₁₂	0-2	78-78-4
Nitrogen	N ₂	0-2	7727-37-9

3.1 Substances

Natural Gas, refrigerated, liquid

CAS No: 8006-14-2

EC No (from EINECS): 232-343-9

REACH Registration number: Not available.

Contains no other components or impurities which will influence the classification of the product.

3.2 Mixture

Not applicable.

Section 4: First Aid Measures

4.1 Description of first aid measures

Eye Contact: Treatment for cold burns: Immediately flush with lukewarm water or with sterile saline solution. Hold eyelids apart, remove contact lenses, if applicable and irrigate for 15 minutes. Apply sterile dressing. Seek immediate medical attention.

Skin Contact: Ensure that clothing around the affected area is loose and does not restrict blood flow. **Do not** remove contaminated clothing which is stuck to the skin until flushing has allowed it to thaw. Gently flush the affected areas with lukewarm water (30°C) for at least 15 minutes or longer as required for skin colour to change from pale yellow through blue to pink or red. **DO NOT RUB.** Apply non-stick sterile dressing and treat as for a thermal burn. Seek immediate medical attention if blistering, tissue freezing or frostbite has occurred.

Inhalation (Breathing): Conscious inhalation victims should be assisted to an uncontaminated area and inhale fresh air. If breathing is difficult, administer oxygen. Unconscious persons should be given artificial resuscitation and supplemental oxygen. Seek medical attention.

RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS

Ingestion (Swallowing): Not relevant as the product is a gas at normal temperatures.

4.2 Most important symptoms and effects, both acute and delayed

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of coordination.

Eye contact **direct contact with liquified gas may burn the eyes.**

4.3 Indication of immediate medical attention and special treatment needed

Treat symptoms. Ensure that medical personnel are aware of the material involved and to take the necessary precautions to protect themselves.

Section 5: Fire Fighting Measures

Product is delivered, stored and used at temperatures above their flash point. Avoid all naked flames, sparks, cigarettes, other ignition sources etc.

IN CASE OF FIRE, VACATE THE AREA AND IMMEDIATELY ALERT THE FIRE BRIGADE.

5.1 Extinguishing media

Dry powder. Foam. Carbon dioxide. Water fog. Use water spray or fog to control fire fumes.

5.2 Special hazards arising from the substance or mixture

Exposure to fire may cause containers to rupture/explode.

Hazardous Combustion Products: Incomplete combustion may form carbon monoxide.

5.3 Special protective actions for firefighters

Specific methods

If possible, stop flow of product. Do not extinguish a leaking gas flame unless absolutely necessary.

LNG vapours are extremely flammable and can be ignited by heat, sparks, flames, static electricity, and other sources of ignition, such as pilot lights, mechanical/electrical equipment, and electronic devices that are not intrinsically safe. Vapours may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. Vapours may accumulate in confined spaces. LNG fires should not be extinguished unless the source of the leak can be stopped safely. In most cases, it is best to eliminate the source of the leak and allow the liquid to burn off.

Isolate the spill or leak area, particularly around the ends of storage vessels, and maintain a safe distance upwind and uphill of the spill or leak area. Let the vessel, tank, or container burn unless the leak can be stopped.

LNG is stored under pressure and temperature controlled conditions; containers of LNG exposed to excessive heat or flame may rupture violently and suddenly without warning due to vessel over-pressurization.

Fragmentation of the containers should be anticipated. Withdraw immediately in the event of a rising sound from a venting safety device. Use water fog and/or deluge to cool equipment, surfaces, and containers exposed to fire and excessive heat.

Do not direct water at the source of the leak, pooled LNG, or safety devices; the indiscriminate use of water on surfaces of cryogenic containers and piping can lead to heavy icing, causing excessive loads on structures and the failure of valves, instrumentation, and other control devices. **Application of water to pools of LNG will cause the LNG to vaporise more rapidly, generating more gas to feed a fire or create a larger vapour cloud.**

For large fires, use unmanned hose holders or monitor nozzles to minimize personnel exposure.

Appropriate fire extinguishing media include dry chemical, carbon dioxide, and high expansion foam.

While water may be used to cool equipment and structures adjacent to an LNG fire, water is not an appropriate extinguishing media when responding to LNG fires as water can increase the volatilization of the LNG or cause ice formation as described above.

Avoid allowing water runoff to contact spilled materials, and do not allow LNG or runoff from firefighting activities to enter drains or water courses as the runoff may create an explosion hazard.

Large fires typically require specially trained personnel and equipment to isolate and extinguish the fire. Hazardous combustion products include smoke, carbon monoxide, carbon dioxide, and other products of combustion. Oxides of nitrogen may also form. LNG storage installations may be equipped with high expansion foam systems that protect LNG storage areas by quickly blanketing liquid LNG in the event of spill, which helps to control vapour release.

High expansion foam is also used to extinguish fires; total flooding of the area of spilled LNG with high expansion foam limits the amount of oxygen required to support free combustion and provides a slow, continuous release of foam solution for cooling and vapour suppression.

Consult LNG facility personnel regarding available onsite spill control, fire suppression, and firefighting systems.

Unsuitable Extinguishing Media

Introducing water stream into Liquefied Natural Gas will rapidly accelerate vaporisation to flammable state. A water fog may be used to direct or shield gas vapour.

Special protective equipment for fire-fighters

Wear protective clothing and pressure-demand breathing apparatus.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

Section 6: Accidental Release Measures

6.1 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.
Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.

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.

6.2 Environmental precautions

Try to stop release.

6.3 Methods and material for containment and cleaning up

Notify relevant authorities in accordance with all applicable regulations.
Ventilate area. Liquid spillages can cause embrittlement of structural materials

Section 7: Handling and Storage

7.1 Precautions for safe handling

Only experienced and trained persons shall handle gases under pressure. Use only the correct specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.

- Prevent static discharges.
- Purge air from system before introducing gas.
- Keep away from ignition sources (including static discharges).
- Do not smoke while handling product.
- Assess the risk of a potentially explosive atmosphere and the need for explosion-proof equipment.
- Use only non-sparking tools.
- Ensure equipment is adequately earthed.
- Ensure the complete gas system has been (or is regularly)
- Checked for leaks before use Refer to supplier's handling instructions.

7.2 Conditions for safe storage, including any incompatibilities

- LNG vessels should be stored below 50°C in a well-ventilated place.
- Segregate from oxidant gases and other oxidants in store.
- Observe all regulations and local requirements regarding storage of LNG.
- Ensure storage area is free from fire risk and away from sources of heat and ignition. Also free of combustible materials.
- All electrical equipment in the storage areas should be compatible with the risk of potentially explosive atmosphere.

7.3 Specific end use(s)

Refer to supplemental exposure scenarios if attached.

Section 8: Exposure controls/personal protection

8.1 Exposure Limit Values

The following limits are taken from the Health and Safety Executives Guidance Note EH40 Workplace Exposure Limits.

8.1.1 Occupational Exposure Limit

Calor Gas Liquefied Natural Gas is not subject to a specific OEL under chemical agents regulations. Methane and Nitrogen are classified simple asphyxiants and EH40 paragraph 56 / Section 2 of COP 2018 applies. It however may present an explosion hazard.

8.2 Exposure Controls

8.2.1 Occupational Exposure Controls

Engineering controls: A risk assessment should be conducted and to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered:

- Product to be handled in a closed system.
- Gas detectors should be used when quantities of flammable gases/vapours may be released.
- Consider work permit system e.g. for maintenance activities. Systems under pressure should be regularly checked for leakages.
- Provide adequate general or local exhaust ventilation

Eye/Face Protection: Protect eyes, face and skin from liquid splashes. Wear a face- shield when transfilling and breaking transfer connections. Safety eyewear, goggles or face-shield (EN166) should be used to avoid exposure to liquid splashes.

Skin/Hand Protection: Wear working gloves and safety shoes while handling containers. Wear cold insulating gloves (EN 511).

Respiratory Protection: If operations are such that significant exposure to vapour may be anticipated, then suitable approved respiratory equipment should be worn.

Environmental Exposure Controls: Refer to local regulation for restriction of emissions to the atmosphere.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Data represent typical values and are not intended to be specifications. N/A = Not Applicable; N/D = Not Determined

Appearances:	Clear colourless liquid.
Odour:	None.
Melting point:	-183°C
Boiling Point:	-161°C
Flash Point:	-188°C
Flammability Limits:	4,6 %(V) -14.8 %(V) in air

Molecular weight:	16 g/mol
Auto-flammability:	595 °C
Vapour Pressure	1.013 bar @ -160°C
liquid density, liquid:	0,31 @ 15°C
Relative density, gas:	0,6 (relative to air)
Solubility in Water:	Very low 26 mg/l
Viscosity	0.20 cP

9.2 Other Information

Pour Point: N/D

Section 10: Reactivity & Stability

10.1 Reactivity	Extremely flammable liquid and vapour. Violently reacts with oxidising agents, oxygen, halogens and metal halides.
10.2 Chemical stability	Stable under normal conditions.
10.3 Conditions to avoid	Keep away from heat/sparks/open flames/hot surfaces and all ignition sources - No smoking
10.4 Incompatible materials	Oxidising agents, acids, heat, ignition sources, oxygen, halogens and metal halides
10.5 Hazardous decomposition products	May react violently with oxidants, Can form potentially explosive atmosphere in air. Under normal conditions of storage and use, hazardous decomposition products should not be produced. Substances arising from the thermal decomposition of these products will largely depend upon the conditions bringing about decomposition. The following hazardous substances may be expected from normal combustion: <ul style="list-style-type: none"> • Carbon Dioxide • Carbon Monoxide may be produced (if there is insufficient air for complete combustion).

Section 11: Toxicological Information

Acute Toxicity:	Non-toxic. A simple asphyxiant which if absorbed by the lungs has the effects the same as oxygen depletion.
Skin Irritation:	Direct contact may cause frostbite. The skin becomes numb and white. Pains, reddening and wounds follow
Carcinogenicity:	No known behaviour
Mutagenicity:	No known behaviour
Teratogenicity:	No known behaviour

Section 12: Ecological Information

Ecotoxicity:	Not classified. Can cause frost damage to vegetation.
Mobility:	The substance is a gas, not applicable.
Persistence and degradability:	No data available.
Bioaccumulative potential:	No data available.
Aquatic toxicity:	Unlikely to cause long term effects in the aquatic environment
Results of PBT Assessment	Not classified as PBT or vPvB.
Other adverse effects	When discharged in large quantities may contribute to the greenhouse effect.

Section 13: Disposal Considerations

Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Do not discharge into any place where its accumulation could be dangerous. Contact supplier if guidance is required

Section 14: Transport Information

Proper Shipping name:	Methane refrigerated, liquid
Road Transport	
UN Number:	1972
Symbol:	Flammable Gas
ADR Class:	2
Classification Code:	3F
Hazard Identification Number:	223
Hazard Class (ADR)	2: Gases; Compressed, liquefied or dissolved under pressure
Hazchem Code:	2YE
Marginal:	2201
CEFIC TEC(R) No:	622-1
Tunnel restriction code:	(B/D)
Rail Transport	
Rail Class No:	2
Railroad Pt:	3F
Sea Transport	
Sea Class:	2.1
IMDG Page No.	2156
MFAG Table No:	620
Air Transport	
Forbidden	

Section 15: Regulatory Information

This material has been classified according to the requirements of implementing the United Nations “Globally Harmonised System of Classification and Labelling of Chemicals” (GHS), EU Regulation 1271/2008 on the Classification, Labelling and Packaging of Substances and Mixtures (the CLP Regulation) and EU Regulation 1907/2006 on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

LEGISLATION

Ensure all national/local regulations are observed.

Safety, health and environmental regulations/legislation specific for the substance or mixture:

Seveso Directive 96/82/EC: Listed

Section 16: Other Information

Date of Issue:	11th October 2021
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Safety Data Sheet Number:	CG-SDS-001
Language:	English

List of Relevant Hazard Statements:

H220: Extremely flammable gas

H224: Extremely flammable liquid and vapour

H281: Contains gas under pressure; may explode if heated

R12: Extremely flammable.

Regulatory Basis of Classification

CLP Classification (EC No 1272/2008)	Regulatory Basis
H220 – Extremely Flammable gas	Based on component information.
H224 – Extremely flammable liquid and vapour	Based on component information
H281 -- Gases under pressure – Refrigerated Liquefied gas	Based on component information.

Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; A D R = Agreement on Dangerous Goods by Road; BMGV = Biological Monitoring Guidance Value; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA = [US] Environmental Protection Agency; Germany-TRGS = Technical Rules for Dangerous Substances; IARC = International Agency for Research on Cancer; ICAO/IATA = International Civil Aviation Organization / International Air Transport Association; INSHT = National Institute for Health and Safety at Work; IMDG = International Maritime Dangerous Goods; Ireland-HSA = Ireland's National Health and Safety Authority; LEL = Lower Explosive Limit; MARPOL = Marine Pollution; N/A = Not Applicable; N/D = Not Determined; NTP = [US] National Toxicology Program; PBT = Persistent, Bio-accumulative and Toxic; RID = Regulations Concerning the International Transport of Dangerous Goods by Rail; STEL = Short Term Exposure Limit; TLV = Threshold Limit Value; TRGS 903 = Technical rules for hazardous substances; TWA = Time Weighted Average; UEL = Upper Explosive Limit; UK-EH40 = United Kingdom EH40/2005 OEL; vPvB = very Persistent, very Bio-accumulative

Disclaimer of Expressed and implied Warranties:

CG –SDS – 001 Last Review: October 2021

Next Review Date: October 2024

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