

Flogas Safety Data Sheet

LNG – NATURAL GAS, REFRIGERATED LIQUID

Data Sheet No 3: Issue 3

Replaces Issue 2

This data sheet has been prepared in accordance with the requirements of Article 31 of EU Regulation 1907/2006 on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

1: IDENTIFICATION OF THE SUBSTANCE OR PREPARATION & SUPPLIER

PRODUCT: NATURAL GAS, REFRIGERATED LIQUID

Including products marketed as: LNG

EINECS NUMBER: 232-343-9 **CAS NUMBER:** 8006-14-2

RECOMMENDED USES:

Flogas LNG is a product intended to be vaporised before use, these uses included:

- fuel for commercial equipment which has been specifically designed to run on Natural Gas;
- internal combustion engine fuel (via on board LNG storage, when used as a propulsion fuel);

Flogas LNG is not supplied for domestic consumer use.

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2: HAZARD IDENTIFICATION

- Extremely Flammable (F+, R12).
- Readily forms an explosive air-vapour mixture at ambient temperature.
- Vapour below minus 112⁰C is heavier than air and may travel to remote sources of ignition (e.g. along drainage systems, into basements etc.).
- Liquid leaks generate large volumes of flammable vapour.
- Refrigerated liquefied gas. Contact with the product may cause cold (cryogenic) burns, frostbite or injury.
- Liquid release or vapour jets present a risk of serious damage to unprotected skin or eyes.

3: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Composition:

Natural Gas, Refrigerated Liquid consisting predominantly of CH₄ hydrocarbon (Methane), with traces of Ethane, Propane and Nitrogen.

As a liquefied state of a gas, which occurs in nature and is not chemically modified, this is exempted from Titles II (Registration), V (Downstream Users) and VI (Evaluation) of the EU REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) Regulation by virtue of Article 2(7)

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4: FIRST AID MEASURES

INHALATION

Remove the affected person to an uncontaminated area (self-contained must be worn if entering contaminated areas). If breathing has stopped administer artificial respiration. Give external cardiac massage if necessary. If the person is breathing, but unconscious, place them in the recovery position. Immediately obtain medical assistance.

EYES

Cold burns should be flushed with water, for at least 15 minutes, to normalise temperature. Cover the eye/s with a sterile dressing and immediately obtain medical assistance.

SKIN

Cold burns should be sprayed with water, for at least 15 minutes, to normalise temperature. Cover the burns with sterile dressings. Do not apply ointments or powders. Immediately obtain medical assistance.

INGESTION

Not considered a potential route of exposure.

5: FIRE-FIGHTING MEASURES

Avoid all naked flames, sparks, cigarettes, etc.

- **IN CASE OF FIRE, IMMEDIATELY ALERT THE FIRE BRIGADE.**
- Ensure an escape path is always available from any fire.
- If gas has ignited, do not attempt to extinguish but stop gas flow and allow to burn out.
- Use water spray to cool heat-exposed containers, and to protect surrounding areas and personnel effecting shut-off.

Every precaution must be taken to keep containers cool to avoid the possibility of a rupture, leading to a boiling liquid expanding vapour explosion (BLEVE).

Pressurised containers are liable to explode violently when subjected to high temperatures.

Extinguishing Media

Large Fire:

- None. Product flow must be stopped and container cooled by water spray. Water fog should be used to assist approach to the source of the fire. Large fires should only be fought by the Fire Brigade.
- DO NOT USE WATER JET

Small Fire:

- Dry Powder or Carbon Dioxide.
- DO NOT USE WATER OR FOAM.

Fires in confined spaces should be dealt with by trained personnel wearing approved breathing apparatus.

Products of Combustion

See Stability and Reactivity, Section 10 of this Safety Data Sheet

6. ACCIDENTAL RELEASE MEASURES

IMMEDIATE EMERGENCY ACTION:

- Clear people away from the area to a safe place;
- Do not operate electrical equipment unless flameproof;
- Summon aid of emergency services;
- Treat or refer casualties if necessary.

FURTHER ACTION – FIRE

IF SAFE TO DO SO :

- Stop product flow
- Use dry powder or carbon dioxide extinguishers
- Cool containers exposed to fire by water fog/spray

FURTHER ACTION – SPILLAGE

IF SAFE TO DO SO:

- Extinguish naked lights, e.g. cigarettes – AVOID MAKING SPARKS.
- Position fire fighting equipment.
- Try to stop the flow of liquid product.
- Cover drains and disperse vapour with water spray.

Note: vapour may collect in confined spaces

7: HANDLING AND STORAGE

HANDLING PRECAUTIONS

- No Smoking or Naked Lights.
- Ensure good ventilation.
- Avoid inhalation of vapour.
- Avoid contact with the liquid and cold vapour.
- Avoid contact with cold pipes and storage containers.
- Wear protective footwear, face shield, clothing and suitable gloves.
- Avoid contact with the eyes.

STORAGE CONDITIONS

- No Smoking or Naked Lights.
- Store only in storage designed for this product.
- Only vaporise in vaporisers designed for this product.
- Store and vaporise only in well ventilated areas away from heat and sources of ignition.
- Storage vessels must be properly labelled.
- Do not remove warning signs labels.

FIRE PREVENTION

- Explosive air/vapour mixtures may form at ambient temperature.

Note: Product spilt on clothing and porous ground may give rise to delayed evaporation and subsequent fire hazards.

8: EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

The following limits are taken from The Health and Safety Executive's Guidance Note EH40: Occupational Exposure Limits.

Occupational Exposure Limits:

Natural Gas, Refrigerated Liquid is not subject to a specific OEL.

*Methane is identified as a simple asphyxiant and EH40 paragraph 57 applies

RECOMMENDED PROTECTIVE CLOTHING

Protective Clothing

- Wear suitable gloves and overalls to prevent cold burns and frostbite (LNG resistant Gauntlet Glove to BS EN 511).
- When transferring liquid/gas and working on the system wear full protective clothing, including impervious gloves (to BS EN 511) and a face shield to BS EN 166.
- Protective footwear (as a minimum work boots) to BS EN345 should be worn.

Respiratory Protection

If operations are such that significant exposure to vapour may be anticipated, then suitable approved respiratory equipment, in compliance with, BS EN 136, should be worn.

The use of respiratory equipment must be strictly in accordance with the manufacturers' instructions and any statutory requirements governing its selection and use.

All wearers of respiratory protection must be trained in its use. The nature of the atmosphere and the working environment will determine the protection required. Equipment must be to the relevant BS EN and this may be determined by reference to BS4275: *Recommendations for the selection, use and maintenance of respiratory protective equipment*.

Environmental Exposure Controls

Discharge of liquid can cause frost damage to vegetation. If discharged to the air in large quantities may contribute to the greenhouse effect. In normal use it is not discharged into the atmosphere but used as a fuel.

9: PHYSICAL AND CHEMICAL PROPERTIES

General Information

Appearance:	Colourless liquefied gas
Odour:	Odourless, odorant added to downstream vaporised gas.
Boiling Point:	-161 °C
Melting Point:	-182 °C
Flammability Limited:	4.4% to 17% (by volume) in air
Auto-flammability:	595 °C
Relative Density of Liquid:	0.42 (Water = 1.0)
Relative Density of Vapour:	0.6 (Air = 1.0)

Important Health, Safety and Environmental Information

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- Readily forms an explosive air-vapour mixture at ambient temperature.
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- Liquid release or vapour jets present a risk of serious damage to unprotected skin or eyes.

Other Information:

No other information is relevant to this product

10: STABILITY AND REACTIVITY

Reactivity

No reactivity hazards other than the effects described in the sub-sections below.

Chemical stability

Stable under normal conditions.

Possibility of hazardous reactions

May react violently with oxidants. Can form potentially explosive atmosphere in air.

Conditions to avoid;

Keep away from heat/sparks/open flames/hot surfaces – no smoking.

Materials to avoid;

Air, Oxidisers. For full material compatibility see latest version of BS EN ISO 11114

Decomposition products;

The substances arising from the thermal decomposition of these products will largely depend upon the conditions bringing about decomposition. The following substances may be expected from normal combustion:

- Carbon Dioxide (CO₂);
- Water (H₂O)

Note: Carbon Monoxide (CO) may be produced if there is insufficient air for complete combustion.

11: TOXICOLOGICAL INFORMATION

Eye contact;

Contact with the REFRIGERATED LIQUID OR GAS will present a risk of serious damage to the eyes.

Skin contact;

Contact with the REFRIGERATED LIQUID OR GAS will cause cold burns and frostbite to the skin.

Inhalation;

Low vapour concentrations may cause nausea, dizziness, headaches and drowsiness. May have a narcotic effect if high concentrations of vapour are inhaled.

High vapour concentrations may produce symptoms of oxygen deficiency which, coupled with central nervous system depression, may lead to rapid loss of consciousness.

Abuse;

Under normal conditions of use the product is not hazardous; however, abuse involving deliberate inhalation of very high concentrations of vapour, even for short periods, can produce unconsciousness and/or result in a sudden fatality.

Carcinogenicity;

No known behaviour.

Mutagenicity;

No known behaviour.

Tetratogenicity;

No known behaviour.

12: ECOLOGICAL INFORMATION

Ecotoxicity;

Can cause frost damage to vegetation..

Air

Natural Gas, Refrigerated Liquid comprises of volatile components which when released to air will react rapidly with hydroxyl radicals and ozone to give carbon dioxide and water.

Water

If released to water the product will rapidly evaporate.

Soil

If released to soil the product will rapidly evaporate.

Mobility;

Spillages are unlikely to penetrate the soil.

Persistence and degradability;

Unlikely to cause long term adverse effects in the environment.

Bioaccumulative potential;

This material is not expected to bioaccumulate.

Aquatic toxicity;

Unlikely to cause long term effects in the aquatic environment.

Results of PBT assessment;

A chemical safety report is not required for this product consequently no PBT is required

Other adverse effects;

No known behaviour

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 a flash back arrestor.

14: TRANSPORT INFORMATION

UN Proper Shipping Name: Natural Gas, Refrigerated Liquid
UN Number: 1972
Symbol: Flammable Gas
Packing Group: N/A

ADR/RID Proper Shipping Name: Natural Gas, Refrigerated Liquid
Substance Identification No.: 1972
Class: 2
Classification Code 3F
Label 2.1
Tunnel Code (B/D)

IMDG Hazard Class: 2.1
Marine Pollutant: No.

Hazard Identification No.: 223
Hazchem Code: 2YE

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 the Chemicals (Hazard Information and Packaging for Supply) regulations (CHIP 4)

Dangerous for Supply**Product Label**

Extremely Flammable Gas
Contains: Natural Gas, Refrigerated Liquid
Symbol: Flame

**Risk Phrases**

H220 Extremely flammable gas
H281 Contains refrigerated gas; may cause cryogenic burns or injury.

Safety Phrases

- P210 Keep away from heat/sparks/open flames/hot surfaces – NO SMOKING
- P282 Wear cold insulating gloves/face-shield/eye protection
- P377 Leaking Gas Fire: Do not extinguish, unless leak can be stopped safely.
- P381 Eliminate all sources of ignition if safe to do so
- P336+P315 Thaw frosted parts with lukewarm water. Do not rub affected areas. Get immediate medical advice/attention.
- P403 Store in a well-ventilated place.

16: OTHER INFORMATION

The references set out below provide further information:

LEGISLATION

Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations

Chemical Hazard Information and Packaging for Supply Regulations (CHIP)

Health and Safety at Work etc. Act

Management of Health and Safety at Work Regulations

Control of Major Accident Hazards Regulations 1999 (as amended)

Dangerous Substances (Notification and Marking of Sites) Regulations

Dangerous Substances and Explosive Atmosphere Regulations

Pipelines Safety Regulations

Gas Safety (Installation and Use) Regulations

The Pressure Systems Safety Regulations 2000

EU Regulation 1907/2006 on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

EU Regulation 1271/2008 on the Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation).

REVISION INFORMATION

Section 2 and 3 reordered to correspond with the 'REACH' regulations, reference to NIHHS regulations removed.