Safety Data Sheet
BioLPG; Renewable Propane; Biopropane

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

1.1. Product identifier

Name:	**Renewable Propane**
Other means of identification:	BioPropane; Unstenched BioPropane; BioLPG (Liquid Petroleum Gas)
Safety Data Sheet Number:	CG-SDS-002
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:	Use as a Fuel

1.3 Details of the supplier of the substance or mixture

Supplier:	
Republic of Ireland:	Calor Teoranta, Long Mile Road, Dublin 12.
Northern Ireland:	Calor Gas Northern Ireland Limited, Airport Road West, 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. Hazard Identification

2.1 Classification of the substance or mixture

CLP Classification (EC No 1272/2008)

Physical Hazards	H220 -- Flammable gases -- Category 1, H280 -- Gases under pressure -- Liquefied gas
Health Hazards	Not classified
Environmental Hazards	Not classified

2.2 Label Elements

EC Number 200 -827 -9

Pictograms

Signal Word **DANGER**

Hazard statements	H220	Extremely flammable gas
	H280	Contains gas under pressure; may explode if heated.

Precautionary statements P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from heat, hot surfaces, open flames, and other ignition sources. No smoking.
P243 - Take action to prevent static discharges.
P377 - Leaking gas fire – do not extinguish unless leak can be stopped safely.
P410+P403 - Protect from sunlight. Store in a well-ventilated place.

2.3 Other hazards

Contact with liquid form may cause frostbite. Vapours in high concentrations are narcotic. Gas or vapour displaces oxygen available for breathing (asphyxiant).

Section 3: Composition / Information on Ingredients

3.1 Mixtures

Chemical Name	CAS Number	EC Number	REACH Registration No.	Concentration[1]	CLP Classification[2]
Propane	74-98-6	200-827-9	01-2119486944-21-0041	≥95	H220 H280
Butane	106-97-8	203-448-7	01-2119474691-32-0000	Max 3%	H220 H280
Ethane	74-84-0	200-814-8	01-2119486765-21-0000	Max 1.5%	H220 H280
Carbon Monoxide	630-08-0	211-128-3	01-2119480165-39-0000	<0.3	H220 H280

[1] All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. [2] Regulation EC 1272/2008.

Heavier Hydrocarbons max 0.2%. Odorized products contain small quantities (<0.1%) ethyl mercaptan as an olfactory indicator.

Section 4: First Aid Measures

4.1 Description of first aid measures

Inhalation Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. If breathing stops, provide artificial respiration. For breathing difficulties, oxygen may be necessary. Get medical attention if symptoms are severe or persist**.**

Ingestion Due to the physical nature of this product, it is unlikely that ingestion will occur.

Skin contact Contact with liquid form may cause frostbite. Rinse immediately contaminated clothing and skin with plenty of water before removing clothes. The product is highly flammable. Thaw frosted parts with lukewarm water. Do not rub affected area. Get medical attention if symptoms are severe or persist.

Eye contact Contact with liquid form may cause frostbite. Rinse immediately with plenty of water. Continue to rinse. Get medical attention.

4.2 Most important symptoms and effects, both acute and delayed.

May cause nausea, headache, dizziness, and intoxication. Contact with liquid form may cause frostbite.

4.3 Indication of immediate medical attention and special treatment needed.

Notes to Physician: Treat symptomatically.

Section 5: Fire-Fighting Measures

5.1 Extinguishing media

Dry chemical or carbon dioxide is recommended. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

5.2 Special hazards arising from the substance or mixture.

Specific Hazards:	Extremely flammable gas. Contents under pressure This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapours may travel considerable distances to a source of ignition where they can ignite, flash back or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. If container is not properly cooled, it can rupture in the heat of a fire. Drains can be plugged, and valves made inoperable by the formation of ice if rapid evaporation of large quantities of the liquefied gas occurs. Do not allow run-off from firefighting to enter drains or water courses – may cause explosion hazard in drains and may reignite.
Hazardous Combustion Products:	Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of nitrogen and sulphur may also be formed.

5.3 Advice for firefighters

Protective actions during Firefighting	Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
Special protective equipment for firefighters	Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing (see Section 8).

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment, and emergency procedures

Personal precautions	Wear adequate protective equipment at all operations.
For emergency responders	Prevent unauthorized access. Vapours are heavier than air and may spread near ground and travel a considerable distance to a source of ignition and flash back. Avoid the accumulation of vapours in low or confined areas. Use only in well-ventilated areas. Ventilate closed spaces before entering them. Eliminate all ignition sources if safe to do so. The use of explosion-proof electrical equipment is recommended.

6.2 Environmental precautions

Stop spill/release if it can be done safely. Water spray may be useful in minimizing or dispersing vapours. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Notify relevant authorities in accordance with all applicable regulations.

6.3 Methods and material for containment and cleaning up.

Methods for cleaning up	Leave small quantities to evaporate, if safe to do so. Pay attention to the fire and health hazards caused by the product.

Section 7 Handling and Storage

7.1 Precautions for safe handling

Keep away from ignition sources such as heat/sparks/open flame – No smoking. Take precautionary measures against static.

discharge. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8).

Extremely Flammable. Contents under pressure. Gas can accumulate in confined spaces and limit oxygen available for breathing. Use only with adequate ventilation Electrostatic charge may accumulate and create a hazardous condition when handling or processing this material. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes for specific bonding/grounding requirements). Cold burns may occur during filling operations. Containers and delivery lines may become cold enough to present cold burn hazard. Do not enter confined spaces such as tanks or pits without following proper entry procedures.

The use of hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of incomplete combustion products (e.g., carbon monoxide, oxides of sulphur and nitrogen, benzene, and other hydrocarbons) and/or dangerously low oxygen levels.

Propane and odorant are heavier than air and will collect and pool along the ground or floor. Odorant, therefore, may not be detectable above the location of propane storage or service (for example, odorant in propane released or leaked into the basement of a dwelling may not be detected above the basement).

WARNING - The intensity of the odorant may fade over prolonged storage or in the presence of rust, when placed initially in new or freshly cleaned storage vessels, or when exposed to masonry.

7.2 Conditions for safe storage, including any incompatibilities.

Keep container(s) tightly closed and properly labelled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post "No Smoking or Open Flame." area signs. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Avoid exposing any part of a compressed- gas cylinder to temperatures above 125F(51.6C). Gas cylinders should be stored outdoors or in well ventilated storerooms at no lower than ground level and should be quickly removable in an emergency. Outdoor or detached storage is preferred. Indoor storage should meet Country or Committee standards and appropriate fire codes.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death.

7.3 Specific end use(s)

Refer to supplemental exposure scenarios if attached.

Section 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits		
Chemical Name	**Ireland-HSA**	**UK - HSE**
Propane	TWA: 1000 ppm / 1800 mg/m^3	---
Butane	TWA: 1000 ppm	---
Ethane	TWA: 1000 ppm	---
Carbon Monoxide	TWA: 20 ppm / STEL 100ppm	TWA: 30 ppm / STEL 200ppm

STEL = Short Term Exposure Limit (15 minutes); TWA = Time Weighted Average (8 hours); --- = No Occupational Exposure Limit

NIOSH REL: TWA 1000 ppm (1800 mg/m^3)
OSHA PEL: TWA 1000 ppm (1800 mg/m^3)

DNEL Derivation of No Effect Level not justified

PNEC **Environmental Predicted No-Effect Concentration (PNEC):** Not applicable

8.2 Exposure controls

Engineering controls: All handling should only take place in well-ventilated areas. Use personal protective equipment and/or local ventilation when needed. Handle in accordance with good industrial hygiene and safety practice.

Eye/Face Protection: The use of eye protection (such as splash goggles) that meets or exceeds EN 166 is recommended when there is potential liquid contact to the eye. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: Wear thermal insulating gloves and face shield or eye protection when working with materials that present thermal hazards (hot or cold).

Respiratory Protection: Filter device/full mask Gas filter, type AX. Filter device could be used maximum 2 hours at a time. Filter devices must not be used in conditions where the oxygen level is low (< 19 vol.-%). At high concentrations, a breathing apparatus must be used (self-contained or fresh air hose breathing apparatus). Filter must be changed often enough. Respirators according to standards EN 140 and EN 141.

A respiratory protection program that follows recommendations for the selection, use, care, and maintenance of respiratory protective devices in EN 529:2005 should be followed whenever workplace conditions warrant a respirator's use.

Environmental Exposure Controls: Handle all packages and containers carefully to minimise spills. Refer to Sections 6, 7, 12 and 13.

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

Appearance:	Gas. A liquid when compressed
Colour:	Colourless
Odour:	Odourless (note: rotten egg / sulphurous if odorant added)
Odour Threshold:	-
pH:	-
Melting Point:	- 187.6 °C
Initial Boiling Point/Range:	- 42.1°C
Flash Point:	- 104 °C
Evaporation Rate :	GAS
Flammability (solid, gas):	Extremely Flammable
Upper Explosive Limits (vol % in air):	9.5%
Lower Explosive Limits (vol % in air):	2.2%
Vapour Pressure	max 1430 kPa @ 40°C
Relative Vapour Density (air=1):	1.6
Relative Density (water=1):	0.51 @ 15°C
Solubility (ies):	Slightly soluble in water. 600 mg/l @ 20°C (propane)
Partition Coefficient (n-octanol/water) (Kow):	2.3
Auto-ignition Temperature:	450 °C
Decomposition Temperature:	-
Viscosity:	0.2 mm²/s @ 15°C
Explosive Properties:	There are no chemical groups present in the product that are associated with explosive properties
Oxidising Properties	Does not meet the criteria for classification as oxidising

9.2 **Other Information**

Critical Temperature: - 3°C

Section 10: Reactivity & Stability

10.1 Reactivity	There are no known reactivity hazards associated with this product.
10.2 Chemical stability	Stable at normal ambient temperatures and when used as recommended.
10.3 Possibility of hazardous reactions	Vapours may form explosive mixtures with air.
10.4 Conditions to avoid	Keep away from heat, sparks, and open flame. Keep away from heat.
10.5 Incompatible materials	Oxidising agents. Acids. Alkalis.
10.6 Hazardous decomposition products	Does not decompose when used and stored as recommended.

Section 11: Toxicological Information

11.1 Information on Toxicological Effects of Substance/Mixture

Substance / Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Based on available data the classification criteria are not met.	Asphyxiant. High concentrations in confined spaces may limit oxygen available for breathing. See Signs and Symptoms.	> 20,000 ppm (gas, estimated)
Dermal	Skin absorption is not anticipated		Not applicable
Oral	Ingestion is not anticipated		Not applicable

Skin Corrosion/Irritation: Contact with the liquefied or pressurized gas may cause frostbite ("cold" burn).

Serious Eye Damage/Irritation: Contact with the liquefied or pressurized gas may cause momentary freezing. followed by swelling and eye damage. Based on available data the classification criteria are not met.

Skin Sensitization: Based on available data the classification criteria are not met.

Germ Cell Mutagenicity: Based on available data the classification criteria are not met for **in-vitro** or **in-vivo** genotoxicity.

Carcinogenicity: Based on available data the classification criteria are not met.

Reproductive Toxicity: **Fertility -** Based on available data the classification criteria are not met.
Development - Based on available data the classification criteria are not met.

Specific Target Organ Toxicity: (Single Exposure) Based on available data the classification criteria are not met.

Specific Target Organ Toxicity: (Repeated Exposure) Based on available data the classification criteria are not met.

Aspiration Hazard:	Not relevant. Vapours in high concentrations are narcotic.
General information:	Vapours in high concentrations are narcotic. High concentrations may reduce the amount of oxygen available for breathing, especially in confined spaces. Hypoxia (inadequate oxygen) during pregnancy may have adverse effects on the developing foetus. The odorant, ethyl mercaptan, can be irritating to the eyes, skin, and respiratory tract. At high concentrations, a person can temporarily lose the ability to smell ethyl mercaptan. In addition, some individuals may have an impaired sense of smell, which inhibits the detection of the odorant.

11.2 Information on Hazardous Components

Propane

Target Organ(s): No systemic or neurotoxic effects were noted in rats exposed to concentrations of propane as high as 12,000ppm for 28 days.
Reproductive Toxicity: No adverse reproductive or developmental effects were observed in rats exposed to propane; no observed adverse effect level = 12,000 ppm.

Section 12: Ecological Information

12.1 Toxicity

Toxicity:	Based on available data the classification criteria are not met. The product is not believed to present a hazard due to its physical nature.

12.2 Persistence and degradability

Persistence and degradability:	Degradable by atmospheric chemistry.
Stability (hydrolysis):	Not relevant.
Biodegradation:	The substance is readily biodegradable.

12.3 Bio accumulative potential	Log Kow values measured for the hydrocarbon gases range from 2.3 for propane to 2.8 for butane and are not regarded as having the potential to bio-accumulate.

12.4 Mobility in soil

Mobility:	Evaporates rapidly from surface water to atmosphere, where degrades.
Henry's law constant:	KH = 0,68 atm m³/mol (propane).

12.5 Results of PBT and vPvB Assessment

Results of PBT and vPvB assessment:	This product does not contain any substances classified as PBT or vPvB.
12.6 Other Adverse Effects	None anticipated.

Section 13: Disposal Considerations

13.1 Waste treatment methods

General information	Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. When handling waste, the safety precautions applying to handling of the product should be considered.

European Waste Code: 16 05 04* gases in pressure containers (including halons) containing dangerous substances.

This material, if discarded as produced, would be considered as hazardous waste pursuant to Directive 2008/98/EC on hazardous waste, and subject to the provisions of that Directive unless Article 1(5) of that Directive applies.
This code has been assigned based upon the most common uses for this material and may not reflect contaminants resulting from actual use. Waste generators/producers are responsible for assessing the actual process used when generating the waste and its contaminants in order to assign the proper waste disposal code.

Disposal must be in accordance with Directive 2008/98/EC and other applicable national or regional provisions and based upon material characteristics at time of disposal. For incineration of waste, follow Directive 2000/76/EC. For landfill of waste, follow Directive 1999/31/EC. Product is suitable for burning in an enclosed controlled burner for fuel value if >5000 BTU, or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Follow Directive 2000/76/EC.

Empty Containers: Container contents should be completely used, and containers emptied prior to discard. Empty drums should be properly sealed and promptly returned to a drum re-conditioner. All containers should be disposed of in an environmentally safe manner and in accordance with applicable regulations.

Section 14: Transport Information

14.1 UN number	UN1978; UN1965
14.2 UN proper shipping name	1978**,** PROPANE; 1965, LIQUEFIED PETROLEUM GAS
14.3 Transport hazard class(es)	2
14.4 Packing group	none
14.5 Environmental hazards	Not a marine pollutant.
14.6 Special precautions for user	
Hazard Identification Number (ADR/RID)	23
Tunnel Restriction Code	(B/D)
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable

Section 15: Regulatory Information

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

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended).

Commission Regulation (EU) No 2015/830 of 28 May 2015 – Safety Data Sheet Format

Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).

Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC.

- LPG is a named substance under Directive 2012/18/EU with following threshold quantities.
- Lower Tier Threshold - 50 tonnes
- Upper Tier Threshold - 200 tonnes

15.2 Chemical Safety Assessment

No data available.

Section 16: Other Information

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List of Relevant Hazard Statements:
H220: Extremely flammable gas
H280: Contains gas under pressure; may explode if heated.

R12: Extremely flammable.

Regulatory Basis of Classification

CLP Classification (EC No 1272/2008)	Regulatory Basis
H220 -- Flammable gases -- Category 1	Based on component information.
H280 -- Gases under pressure -- Liquefied gas	Based on component information.

Guide to Abbreviations:
ACGIH = American Conference of Governmental Industrial Hygienists; ADR = 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.

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