

SAFETY DATA SHEET

LIQUEFIED NATURAL GAS (LNG) — INDUSTRIAL GRADE

GHS Compliant • Cryogenic Product • Revision 3.0 • Issue Date: 18 April 2026

■ **CRYOGENIC HAZARD:** LNG is stored and transported at approximately -162°C . Contact with skin or eyes causes severe freeze burns. Rapid vaporisation in confined spaces creates asphyxiation and explosion risk. Handle only with trained personnel and appropriate cryogenic PPE.

SECTION 1 — IDENTIFICATION

Product Name:	Liquefied Natural Gas (LNG) — Industrial Grade
Trade Names:	LNG, Liquefied Methane, Natural Gas (liquefied), Cryogenic LNG
CAS Number:	74-82-8 (Methane, principal component); Mixture: 68410-63-9
EC Number:	200-812-7 (Methane)
UN Number:	UN 1972
Intended Use:	Fuel for power generation, industrial heating, marine bunker fuel, petrochemical feedstock, pipeline gas after regasification, LNG-to-power projects, residential/commercial gas supply
Restrictions:	For industrial/commercial use only. Requires licensed LNG terminal, regasification, or cryogenic handling infrastructure.
Supplier:	Canven Group PLT C-6-2, Megan Avenue 1, No.189, Jalan Tun Razak, 50400 Kuala Lumpur, Malaysia contact@canvengroup.com +60124997937
Emergency Contact:	CHEMTREC International: +1-703-527-3887 (24hr, collect calls accepted) Malaysia Emergency: 999 DOSH: 03-8000 8000

SECTION 2 — HAZARD IDENTIFICATION

■ Flame Extremely Flammable Gas H220	*■ Snowflake Cryogenic Liquid H281	■ Exclamation Simple Asphyxiant H280	■ Explosion Explosive Vapour H220
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Signal Word:	DANGER
Hazard Statements:	H220 — Extremely flammable gas H280 — Contains gas under pressure; may explode if heated H281 — Contains refrigerated gas; may cause cryogenic burns or injury H336 — May cause drowsiness or dizziness (oxygen displacement) EUH019 — May form explosive peroxides (not applicable to LNG) Simple Asphyxiant — Displaces oxygen in enclosed spaces
Precautionary Stmts:	P210 — Keep away from heat, sparks, open flames, hot surfaces. No smoking. P260 — Do not breathe gas/vapours. P271 — Use only outdoors or in well-ventilated area. P282 — Wear cold-insulating gloves, face shield and eye protection. P336 — Thaw frosted parts with lukewarm water. Do not rub affected areas. 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.
Additional Hazards:	CRYOGENIC: Boiling point -162°C . Contact with cryogenic liquid causes immediate severe freeze burns. Rapid phase change (1 litre liquid \rightarrow ~600 litres vapour) creates overpressure risk in confined spaces. ROLLOVER: Density stratification in LNG tanks may lead to sudden, violent vaporisation (rollover). Risk management requires temperature and density monitoring.

SECTION 3 — COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS No.	EC No.	Typical mol%	Classification (GHS)
Methane (CH ₄)	74-82-8	200-812-7	85 – 99%	Flam. Gas 1 (H220) Refrig. Gas (H281)

Ethane (C ₂ H ₆)	74-84-0	200-814-8	0 – 10%	Flam. Gas 1 (H220) Press. Gas (H280)
Propane (C ₃ H ₈)	74-98-6	200-827-9	0 – 5%	Flam. Gas 1 (H220) Press. Gas (H280)
Butane (C ₄ H ₁₀)	106-97-8	203-448-7	0 – 2%	Flam. Gas 1 (H220) Press. Gas (H280)
Nitrogen (N ₂)	7727-37-9	231-783-9	0 – 1%	Press. Gas (H280) Simple asphyxiant
CO ₂ , H ₂ S, Mercaptans	Various	—	< 50 ppm each (trace, liquefaction spec.)	H ₂ S: H330, H311, H301 CO ₂ : H280

Note: Exact composition varies by source (Qatar, Australia, Malaysia, US, Russia, etc.). Specific cargo composition per Certificate of Quality (COQ) issued at loading port.

SECTION 4 — FIRST AID MEASURES

Inhalation:	Remove to fresh air immediately. If unconscious but breathing, place in recovery position. If not breathing, administer CPR. High concentrations displace oxygen — do not enter confined space without SCBA. Call emergency services immediately.
Cryogenic Skin Contact:	Do NOT rub. Remove contaminated clothing carefully (may be frozen to skin). Gently rewarm with lukewarm water (38–43°C). Do NOT use hot water. Cover with sterile dressing. Seek immediate medical attention. Treat as thermal burn.
Cryogenic Eye Contact:	Immediately flush with large amounts of lukewarm water for minimum 15 minutes, holding eyelids open. Seek immediate ophthalmological attention. Do NOT attempt to remove contact lenses manually if frozen.
Ingestion:	Not a relevant exposure route. LNG vaporises instantly at ambient temperatures.
Notes to Doctor:	Treat cryogenic burns as thermal burns. Monitor for cardiac arrhythmia from oxygen deprivation. No specific antidote.

SECTION 5 — FIRE-FIGHTING MEASURES

Extinguishing Media:	Dry chemical powder, CO ₂ . Water spray (to disperse vapour clouds and cool storage vessels). Do NOT use water jet directly on LNG liquid — rapid vaporisation will occur.
Special Fire Hazards:	Vapour cloud explosion (VCE) risk if large release ignites. Boilover / BLEVE possible if LNG storage tank exposed to fire. Rollover in storage can produce rapid, uncontrolled vaporisation. Methane is lighter than air at ambient temperature but heavier when cold (< -107°C) — may accumulate at ground level initially.
Fire-Fighting Procedure:	Immediately evacuate non-essential personnel. Alert LNG terminal emergency response team. Do NOT extinguish LNG fire unless gas supply can be safely shut off — unburned gas cloud is more dangerous than burning gas. Cool surrounding structures with water. Use SCBA. Minimum safe distance for large LNG pool fires: 500m.
Specific Risks:	Pool fire radiation flux at 30m: up to 220 kW/m ² . Vapour cloud explosion overpressure can cause structural damage at significant distances. LNG spills on water cause rapid phase transitions.
HAZCHEM Code:	2WE
ERG Guide No.:	115

SECTION 6 — ACCIDENTAL RELEASE MEASURES

Personal Precautions:	Evacuate all non-essential personnel. Eliminate ALL ignition sources (including vehicles, mobile phones, static electricity). Wear full cryogenic PPE and SCBA. Do NOT walk through spilled LNG. Establish exclusion zones — minimum 300m for large spills.
Environmental Precautions:	LNG is not persistent in the environment. Methane is a potent greenhouse gas (GWP ₁₀₀ = ~28). Large releases must be reported to relevant environmental authorities. Prevent vapour entry into drains, sewers, or basement areas.
Containment:	If safe, stop the source of the leak. Allow LNG to vaporise naturally in a controlled manner. Contain liquid spills using bunded areas — do NOT use sand or soil to absorb. Keep sources of ignition well away from vapour cloud. Monitor with combustible gas detectors.

Large Release (MFCP):

Activate Major Facility Contingency Plan. Notify DOSH, Fire & Rescue Department, and local authorities immediately. Engage specialist LNG emergency response contractors.

SECTION 7 — HANDLING AND STORAGE

Handling:	Only trained and authorised personnel may handle LNG. Use cryogenic transfer equipment rated for -196°C service. Pre-cool all transfer lines before filling. Bond and earth all equipment. Maintain positive pressure in storage vessels to prevent air ingress. Conduct regular leak tests. Comply with IGC Code (IMO), NFPA 59A, and applicable national cryogenic gas regulations.
Storage:	Store in vacuum-insulated cryogenic tanks (double-wall, perlite or vacuum insulation). Maximum fill level: 95%. Monitor BOG (Boil-Off Gas) continuously. Temperature range: -165°C to -157°C . Pressure: operating at 0.5 – 10 barg (tank design dependent). Tank areas must comply with NFPA 59A / EN 1473 / BS PD 7974 exclusion zone requirements.
Tank Aging / Rollover:	Monitor LNG density stratification. Implement mixing protocols to prevent rollover. Record and trend BOG rates.
Incompatibilities:	Liquid oxygen, strong oxidising agents, halogenated materials. LNG is incompatible with most plastics at cryogenic temperatures — use only materials rated for cryogenic service (stainless steel 304L/316L, aluminium alloys, Invar).

SECTION 8 — EXPOSURE CONTROLS / PERSONAL PROTECTION

Substance	OEL TWA	OEL STEL	LEL / UEL	Basis
Methane (CH ₄)	Simple asphyxiant (no OEL — maintain O ₂ > 19.5%)	—	5.0% / 15.0% v/v	ACGIH / OSHA
Ethane (C ₂ H ₆)	Simple asphyxiant	—	3.0% / 12.5% v/v	ACGIH
H ₂ S (trace)	1 ppm (TWA)	5 ppm (STEL)	4.3% / 46%	ACGIH TLV-C: 1 ppm
O ₂ Level (area):	Min. 19.5% v/v	Below 16%: danger	—	OSHA 29 CFR 1910.146

Engineering Controls:	Continuous methane/O ₂ gas detection with audible and visual alarms (set at 10% LEL for methane). Forced ventilation in enclosed areas. Explosion-proof electrical equipment (ATEX Zone 1/2 or equivalent). Emergency shutdown systems (ESD). Continuous BOG monitoring.
Respiratory Protection:	SCBA (Self-Contained Breathing Apparatus) mandatory for confined space entry, leak response, or any O ₂ -deficient atmosphere. Supplied-air respirator for extended operations. Air-purifying respirators are NOT acceptable for LNG emergency response.
Cryogenic Hand Protection:	Cryogenic insulating gloves rated to -196°C (e.g., Tempshield Cryo-Protection gloves). Loose-fitting — must be easily removable.
Eye / Face Protection:	Full-face cryogenic face shield. Safety goggles for general area work.
Body Protection:	Cryogenic apron or coverall. Safety boots with steel toe cap, no lace-up (for quick removal). Antistatic clothing.
Thermal / Fire:	Fire-resistant (FR) clothing where ignition risk exists. No synthetic fabrics near LNG operations.

SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Cryogenic liquid at storage conditions; colourless gas at ambient
Appearance:	Colourless, odourless cryogenic liquid (gas is also odourless — odorant added only after regasification for distribution)
Boiling Point:	-161.5°C (methane) at atmospheric pressure; mixture: -162°C to -158°C
Liquid Density:	430 – 470 kg/m ³ at -162°C (varies with composition)
Vapour Density (air=1):	0.55 (methane) — lighter than air at ambient temperature Note: Cold vapour cloud may initially be denser than air

Expansion Ratio:	~600:1 (1 litre LNG → ~600 litres gas at ambient conditions)
Vapour Pressure:	Atmospheric to ~10 barg (storage tank dependent)
Flash Point:	–188°C (methane) — product is below flash point during storage
Auto-Ignition Temp.:	537°C (methane in air)
Flammable Limits:	LEL: 5.0% v/v UEL: 15.0% v/v (methane in air)
Methane Number:	Typically > 70 (composition dependent)
Gross Calorific Value:	~55.5 MJ/kg (methane) ~23 MJ/Nm ³ (gas phase)
Wobbe Index:	Typically 48 – 53 MJ/Nm ³ (GHV basis)
Viscosity (liquid):	~0.12 mPa·s at –162°C
Critical Temperature:	–82.6°C (methane)
Critical Pressure:	46.1 bar (methane)
Solubility in Water:	Slightly soluble (22.7 mg/L at 20°C, 1 atm)

SECTION 10 — STABILITY AND REACTIVITY

Stability:	Stable under normal cryogenic storage and transport conditions.
Conditions to Avoid:	Heat sources, open flames, ignition sources, mechanical shock on cryogenic vessels, rapid pressurisation, air ingress into cryogenic storage (risk of oxygen enrichment on vaporisation).
Incompatible Materials:	Liquid oxygen (explosive mixture), strong oxidising agents, halogens. Incompatible with most elastomers and plastics at cryogenic temperatures. Carbon steel becomes brittle at cryogenic temperatures — do NOT use.
Hazardous Decomposition:	Incomplete combustion produces CO and CO ₂ . No hazardous decomposition under normal storage conditions.
Rollover Risk:	Stratification of LNG in tanks of different densities/temperatures can result in sudden, rapid vaporisation. Risk managed through density monitoring and bottom-loading / mixing protocols.
Hazardous Polymerisation:	Will not occur.

SECTION 11 — TOXICOLOGICAL INFORMATION

Acute Toxicity:	Methane: LC ₅₀ (rat, inhalation) > 800,000 ppm. Product is a simple asphyxiant — not inherently toxic but displaces oxygen.
Asphyxiation Levels:	O ₂ < 19.5%: Impaired coordination O ₂ < 16%: Headache, tachycardia O ₂ < 12%: Nausea, unconsciousness O ₂ < 6%: Death within minutes
Cryogenic Burns:	Contact with liquid LNG causes immediate severe cryogenic burns (freeze burns) equivalent to thermal burns. Can cause permanent tissue damage.
Chronic Toxicity:	No evidence of chronic toxicity from methane exposure at sub-asphyxiant levels. Methane is not classified as carcinogenic (IARC Group 3 basis).
H₂S (trace):	IDLH: 100 ppm. Even trace levels may cause olfactory fatigue — do NOT rely on smell to detect H ₂ S. Use gas detection instruments.
DNEL (Workers, inhal.):	Not established for methane (simple asphyxiant). Maintain O ₂ ≥ 19.5% at all times.

SECTION 12 — ECOLOGICAL INFORMATION

Ecotoxicity:	Methane is not classified as aquatic hazard. Not toxic to organisms under normal environmental concentrations.
GHG Impact:	Methane GWP ₁₀₀ = 28 CO ₂ -equivalent (IPCC AR6). Large uncontrolled releases are a significant climate concern. Minimise fugitive emissions.
Persistence:	Methane is biodegraded by methanotrophic bacteria in soil/water. Atmospheric half-life approximately 9–12 years.
Bioaccumulation:	Does not bioaccumulate (log K _{ow} = 1.09).

Mobility: Gaseous methane disperses rapidly in atmosphere. LNG spilled on water forms vapour clouds — monitor downwind.

ODP: Zero — LNG has no ozone depletion potential.

SECTION 13 — DISPOSAL CONSIDERATIONS

Disposal Method: BOG (Boil-Off Gas) should be recovered and used as fuel wherever possible. Flaring is acceptable only when BOG recovery is not feasible. LNG tank cleaning/decommissioning requires specialist cryogenic contractor. Comply with local hazardous waste regulations and environmental permits.

Waste Code (EU): 16 05 05 (gases in pressure containers not containing halons)

Venting: Controlled venting of BOG to safe elevated location only. Do NOT vent near ignition sources or in enclosed areas.

SECTION 14 — TRANSPORT INFORMATION

Regulation	Class	UN No.	Proper Shipping Name	PG	Special Prov.
IMDG (Sea)	2.1	UN 1972	Methane, refrigerated liquid (LNG)	—	T75, TP5, BK1 IGC Code applies
IATA (Air)	2.1	UN 1972	Methane, refrigerated liquid	—	Forbidden in passenger aircraft. Cargo aircraft: see IATA DGR
ADR/RID (Road/Rail)	2F	UN 1972	Methane, refrigerated liquid	—	Tank Code: P203, T75 Special Prov: 592
IMO IGC Code (Vessel)	—	UN 1972	Methane / LNG	—	IGC Code Ch.19 applies LNG Carrier: Type 2G vessel

Marine Pollutant: No

EmS Code (IMDG): F-D, S-U

Special Precautions: LNG must be transported in Type C cryogenic tanks (IMO T75 portable tanks) or dedicated LNG carriers (LNGCs) compliant with IGC Code. BOG management system required during transport. Tank pressure must be monitored continuously. Relief valve settings must comply with tank design pressure.

LNG Carrier Types: MOSS (spherical tanks), Membrane (GTT Mark III / NO96), Type C (small-scale / bunkering). Cargo containment systems per IGC Code Chapter 4.

SECTION 15 — REGULATORY INFORMATION

EU / UK Regulation: Classified per Regulation (EC) 1272/2008 (CLP). REACH: Methane registered (ECHA). EU ETS applies to LNG combustion emissions. EU Gas Regulation (EC) 715/2009.

USA: OSHA HazCom 2012 (29 CFR 1910.1200). NFPA 59A (LNG storage/handling). FERC LNG export licence requirement. DOT 49 CFR Part 193.

Malaysia: Occupational Safety and Health Act 1994. Gas Supply Act 1993. Energy Commission Act 2001. Environmental Quality Act 1974 (EQA). DOSH permit required for LNG storage facilities.

China: IECSC registered. GB 11174 (LNG standard). GB/T 19204 (LNG general characteristics). NDRC LNG import licence. Safety Tech. Regulation for Pressure Vessels (TSG 21-2016).

India: PNGRB regulations. Explosives Act 1884. PESO LNG terminal approvals.

IMO: IGC Code (International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk). MARPOL Annex VI. ISM Code applies to LNG carriers.

Kyoto / Paris: Methane is a regulated GHG. LNG production and transport subject to national GHG reporting obligations.

SECTION 16 — OTHER INFORMATION

Revision History:	Version 3.0 — Full revision per GHS Rev.9 (UN 2021), EU CLP 10th ATP, and IOGP Report 477 updates
Issue Date:	18 April 2026
Prepared By:	HSE / Product Stewardship — Canven Group PLT
Key Standards Referenced:	IGC Code (IMO 2016 Edition); NFPA 59A (2023); EN 1473 (LNG installations); ISO 16903 (LNG characteristics); ISO 13758 (LNG purity); GIIGNL LNG Custody Transfer Handbook; ACGIH TLVs & BEIs 2024; IOGP Life-Saving Rules
Abbreviations:	BOG — Boil-Off Gas LNG — Liquefied Natural Gas LCNG — LNG to CNG SCBA — Self-Contained Breathing Apparatus ESD — Emergency Shutdown BLEVE — Boiling Liquid Expanding Vapour Explosion VCE — Vapour Cloud Explosion GWP — Global Warming Potential IGC — International Gas Carrier Code
Full Text of H-Statements:	H220 — Extremely flammable gas H280 — Contains gas under pressure; may explode if heated H281 — Contains refrigerated gas; may cause cryogenic burns H336 — May cause drowsiness or dizziness
Disclaimer:	This Safety Data Sheet has been prepared in good faith based on available scientific and regulatory data. It does not constitute a product specification. The information is applicable to the product as described and may not be valid for use in combination with other materials or in other processes. Users must conduct their own risk assessments. Canven Group PLT accepts no liability for damages arising from use of this document without verification against the actual cargo Certificate of Quality (COQ).

Prepared in accordance with GHS (Globally Harmonized System) Rev.9, EU Regulation 1272/2008 (CLP), OSHA HazCom 2012 (29 CFR 1910.1200), and ISO 11014:2009. Format compliant with REACH Annex II (Commission Regulation EU 2020/878). This document supersedes all previous versions.