

MATERIAL SAFETY DATA SHEET

I PRODUCT INFORMATION

PRODUCT NAME	LPG
PRODUCT USE	Fuel
CHEMICAL IDENTIFICATION	Liquified Petroleum Gases
MANUFACTURER & SUPPLIER INFORMATION	ENERCHEM INTERNATIONAL INC. 450, 440 – 2 Ave SW Calgary, Alberta T2P 5E9 (403) 269-1500
EMERGENCY NUMBER – CANUTEC	(613) 996-6666

II HAZARDOUS INGREDIENTS

INGREDIENT	CAS#	% (wt/wt)	LD ₅₀	LC ₅₀
Natural gas (petroleum), raw liq. mix	64741-48-6	100	NAV	NAV

III PHYSICAL DATA

PHYSICAL STATE	Liquified gas
ODOUR & APPEARANCE	Natural gas odour / clear, colourless appearance
ODOUR THRESHOLD	NAV
REID VAPOR PRESSURE (kPa)	ND
VAPOR DENSITY (air = 1.0) (< 1.0 = lighter than air, 1.0 > = heavier than air)	1.0 >
EVAPORATION RATE (NBuAc = 1.0) (< 1.0 = SLOW, 1.0 > = MEDIUM to FAST)	NAV
BOILING POINT (°C)	-96 to 170
FREEZE / POUR POINT (°C)	NAV
pH	NAV
SPECIFIC GRAVITY (H₂O = 1.0) (< 1.0 = lighter than H ₂ O, 1.0 > = heavier than H ₂ O)	0.584
COEFFICIENT OF WATER / OIL DISTRIBUTION (< 1.0 = oil soluble, 1.0 > = water soluble)	ND

IV FIRE OR EXPLOSION HAZARD

MEANS of EXTINGUISHION	<p>SMALL FIRE: Use dry chemical powder.</p> <p>LARGE FIRE: In case of fire, allow gas to burn if flow cannot be shut off immediately. Do not extinguish a leaking gas flame unless leak can be stopped. Use water spray, fog or foam. Do not use water jet. Move containing vessels from fire IF WITHOUT RISK. Cool containing vessels with flooding quantities of water until well after fire is out. If fire can be controlled, cool container with water from unmanned hose holder or monitor nozzles until well after fire is out. Extinguish secondary fire. Handle damaged cylinders with extreme care.</p> <p>DO NOT FIGHT FIRE WHEN IT REACHES MATERIAL. Withdraw from fire and let it burn. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. First move people out of line-of-sight of the scene and away from windows.</p>
FLASHPOINT (°C, Seta Flash Closed Cup)	< -40 (estimated)
UPPER EXPLOSION LIMIT (% vol)	15
LOWER EXPLOSION LIMIT (% vol)	1.1
AUTO-IGNITION TEMPERATURE (°C)	ND
HAZARDOUS COMBUSTION PRODUCTS	Hydrogen sulphide (H ₂ S), oxides of sulphur (SO ₂ , SO ₃ ...), oxides of carbon (CO, CO ₂) and products of incomplete combustion.
EXPLOSION DATA: SENSITIVITY to IMPACT	When mixed with air, flammable vapours can explode in a confined area.
EXPLOSION DATA: SENSITIVITY to STATIC DISCHARGE	Expected to be sensitive to static discharge when vapours are present at the lower and upper explosive limits. Ground equipment before transfer.

V REACTIVITY DATA

STABILITY	Stable
REACTIVITY	Hazardous polymerization will not occur.
INCOMPATIBLE MATERIALS	Highly reactive with strong oxidizing agents, incompatible with halogenated compounds.
HAZARDOUS DECOMPOSITION PRODUCTS	On combustion, hydrogen sulphide (H ₂ S), oxides of sulphur (SO ₂ , SO ₃ ...), oxides of carbon (CO, CO ₂) and products of incomplete combustion.

VI TOXICOLOGICAL PROPERTIES

SKIN CONTACT	Liquid can cause burns similar to frostbite. Repeated or prolonged contact may cause defatting and dermatitis. Harmful if absorbed through the skin. Repeated or prolonged exposure can produce blood disorders.
SKIN ABSORPTION	Extensive, prolonged or repeated contact may result in significant absorption.
EYE CONTACT	Liquid can cause burns similar to frostbite. This product causes irritation, redness and pain.
INHALATION	Irritating to the nose, throat and respiratory tract. Inhalation causes headaches, dizziness, drowsiness, nausea and may lead to unconsciousness. Vapours may contain hydrogen sulphide (H ₂ S) gas which can be harmful or fatal if inhaled.
INGESTION	Not Applicable (Liquified gas).
CHRONIC OVER EXPOSURE EFFECTS	May cause depression, dizziness, numbness, tremors, impaired memory, headaches and nausea. Kidney and liver damage may result.
EXPOSURE LIMITS	None assigned. May contain Hydrogen Sulphide which has the following limits: Hydrogen Sulphide – ACGIH TLV = 10 ppm (TWA), 15 ppm (STEL)
IRRITANCY	Liquid and vapour may cause irritation of the skin, eyes, nose, throat and respiratory system.
SENSITIZATION	No information is available.
CARCINOGENICITY, TERATOGENICITY, EMBRYOTOXICITY, REPRODUCTIVE TOXICITY & MUTAGENICITY	The ingredients of this product are not classified as carcinogenic by <u>ACGIH</u> or <u>IARC</u> . No adverse reproductive effects are anticipated. No information is available and no adverse mutagenic effects are expected.
TOXICOLOGICALLY SYNERGISTIC PRODUCTS	No information is available.

VII PREVENTIVE MEASURES

PERSONAL PROTECTION & SANITATION	SKIN – Prevent skin contact	EYES – Prevent eye contact
	WASH SKIN – When contaminated	REMOVE – When contaminated
	CHANGE – No recommendation	PROVIDE – Eyewash
PERSONAL PROTECTIVE EQUIPMENT	Emergency or planned entry into unknown concentrations or IDLH conditions – Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode / any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.	
	Escape – Any appropriate escape-type, self-contained breathing apparatus.	
	Eye/Face Protection – Chemical goggles and a facemask.	
	Skin Protection – Wear gloves (insulated suitable for low temperatures), coveralls, boots, etc. as needed to prevent skin exposure.	
SPECIFIC ENGINEERING CONTROLS	Local exhaust ventilation or other engineering controls required to keep airborne concentrations of vapours below occupational exposure limits. Ensure that eyewash stations and safety showers are proximal to the work-station location.	
LEAK & SPILL PROCEDURES	Provide adequate ventilation, protective clothing and respiratory apparatus. Remove sources of heat and flame. Absorb liquid on dry clay, sand, sawdust or other absorbent material and transfer to disposal containers.	
WASTE DISPOSAL	Combustible wastes may be burned in an approved incineration facility. Consult local environmental authorities before disposal.	
HANDLING PROCEDURES & EQUIPMENT	Use minimal quantities in designated areas with adequate ventilation and away from sources of heat or sparks. Containers should be covered when not in use.	
STORAGE REQUIREMENTS	Store in a tightly closed container in a cool area away from immediate work areas, incompatible materials and any sources of heat, flame or sparks.	
EMPTY CONTAINERS	The container for this product can present an explosion/fire hazard even when empty. DO NOT cut, puncture or weld on or near the container. Follow label warnings even after the container has been emptied as it may retain product residue.	


VIII FIRST AID MEASURES

SKIN CONTACT	<p>Soap wash immediately. If this chemical contacts the skin, wash the contaminated skin with soap and water immediately. If this chemical penetrates the clothing, immediately remove the clothing and wash the skin with soap and water. If irritation persists after washing, get medical attention. Wash clothing before reuse.</p> <p>Contact with liquid: Immediately flush with large amounts of TEPID water (105 to 115 °F or 41 to 46 °C). DO NOT USE HOT WATER. Get medical attention immediately.</p>
EYE CONTACT	<p>Irrigate immediately. If this chemical contacts the eyes, immediately wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately.</p> <p>Contact with liquid: Immediately flush with large amounts of TEPID water (105 to 115 °F or 41 to 46 °C). DO NOT USE HOT WATER. Get medical attention immediately.</p>
INHALATION	Respiratory support. If a person breathes large amounts of this chemical, move the exposed person to fresh air at once. If breathing has stopped, perform mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.
INGESTION	Not Applicable (Liquified gas).
GENERAL	Provide general supportive measures (comfort, warmth, rest). Consult a doctor for all exposures except minor instances of inhalation or contact.

IX PREPARATION INFORMATION

PREPARED BY	ENERCHEM INTERNATIONAL INC. Oilfield Services Group – (780) 980-1682
DATE PREPARED	June 22, 2006
LATEST DATE REVISED	August 12, 2009

X CLASSIFICATIONS

WHMIS		
Class A	Compressed Gas	
Class B, Division 2	Flammable Liquid	
Class D, Division 2A	Very Toxic Material Causing Other Toxic Effects	
Class D, Division 2B	Toxic Material Causing Other Toxic Effects	
TDG		
Proper Shipping Name	PETROLEUM GASES, LIQUIFIED	
UN#	1075	
Class	2.1	
Packing Group	None	
Emergency Response Guide	Guide 115	Gases – Flammable (Including Refrigerated Liquid)

XI ADDITIONAL INFORMATION

MSDS PREPARATORY STATEMENT

The information presented herein is, to the best of our knowledge and belief, accurate and reliable as of the date completed, relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any processes. ENERCHEM INTERNATIONAL INC. makes no guarantee, warranty, or representation as to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use. ENERCHEM INTERNATIONAL INC. does not accept liability for any loss or damage that may occur from the use of this information nor do we offer any warranty against patent infringement.

ABBREVIATIONS and DEFINITIONS	
<	less than
>	greater than
CEILING	ceiling concentration – the concentration of an airborne substance that must not be exceeded at <u>any</u> time
°C	degrees Celsius
gm	grams
H ₂ O	water
IDLH	immediately dangerous to life or health – NIOSH – any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.
kg	kilograms
kPa	kilopascals
L	litres
ml	millilitres
m ³	cubic metres
NAP	not applicable
NAV	not available
NBuAc	normal butyl acetate – used as standard for determining evaporation rate
ND	not determined
PEL	permissible exposure limit – OSHA – the airborne concentration of a material that must not be exceeded during any 8-hour work shift of a 40-hour workweek
µL	microlitre – one-millionth (10 ⁻⁶) of a litre
ppm	parts per million
STEL	short term exposure limit – OSHA 15-minute TWA exposure (unless otherwise noted) that should not be exceeded at any time
TLV	threshold limit values – ACGIH – the airborne concentration of a material to which nearly all persons can be exposed day after day without adverse effects
TWA	time-weighted average exposure – the airborne concentration of a material that must not be exceeded during any 8-hour work shift of a 40-hour workweek

REFERENCES USED	
ACGIH	American Conference of Governmental Industrial Hygienists (US)
CANUTEC	Canadian Transport Emergency Centre (Canada)
CAS	Chemical Abstracts Service (US)
CPR	Controlled Products Regulations (Canada)
IARC	International Agency for Research on Cancer
NIOSH	National Institute for Occupational Safety and Health (US)
NTP	National Toxicology Program (US)
OSHA	Occupational Safety and Health Administration (US)
TDG	Transportation of Dangerous Goods (Canada)
WHMIS	Workplace Hazardous Materials Information System (Canada)
SUPPLIERS'	Material Safety Data Sheets ∞