



1. MATERIAL AND COMPANY IDENTIFICATION

Material Name : Liquefied Petroleum Gas
Other names : LPG; Butane
Product Use : Fuel

Company : **Kenya Petroleum Refineries Ltd**
PO Box 90401 - 80100
Mombasa, KENYA.

Emergency Telephone/Fax Numbers : Tel: + 254 - 041- 3433511-19 / 2220967
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2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	Concentration
Hydrocarbons, C3-C4	68476-85-7	99 - 100 %
Ethyl mercaptan	75-08-1	0 - 1 %

3. HAZARDS IDENTIFICATION

Appearance : Colourless liquid under pressure.
Odour : Unpleasant, penetrating
Health Hazards : High gas concentrations will displace available oxygen from the air; unconsciousness and death may occur suddenly from lack of oxygen. Vapours may cause drowsiness and dizziness. Exposure to rapidly expanding gases may cause frost burns to eyes and/or skin.

Inhalation : High gas concentrations will displace available oxygen from the air; unconsciousness and death may occur suddenly from lack of oxygen. Vapours may cause drowsiness and dizziness.

Skin Contact : Exposure to rapidly expanding gases may cause frost burns to eyes and/or skin.

Other Information : Possibility of organ or organ system damage from prolonged exposure; see Chapter 11 for details. Target organ(s): Cardiovascular system.

Signs and Symptoms : Central nervous system (CNS): may cause tremors and convulsions. Other signs and symptoms of CNS depression may include headache, nausea, and lack of coordination.

Aggravated Medical : Pre-existing medical conditions of the following organ(s) or



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- Condition** organ system(s) may be aggravated by exposure to this material: Cardiovascular system.
- Safety Hazards** : Electrostatic charges may be generated during pumping, which may cause fire. This material is shipped under pressure. Vapors are heavier than air. Vapors may travel across the ground and reach remote ignition sources causing a flashback fire danger. Flammable gas. May form flammable/explosive vapor-air mixture.

4. FIRST AID MEASURES

- Inhalation** : Remove to fresh air. Do not attempt to rescue the victim unless proper respiratory protection is worn. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting, or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.
- Skin Contact** : Slowly warm the exposed area by rinsing with warm water. Transport to the nearest medical facility for additional treatment.
- Eye Contact** : Slowly warm the exposed area by rinsing with warm water for 20 minutes. Transport to the nearest medical facility for additional treatment.
- Ingestion** : In the unlikely event of ingestion, obtain medical attention immediately.
- Advice to Physician** : Potential for cardiac sensitization, particularly in abuse situations. Hypoxia or negative inotropes may enhance these effects. Consider oxygen therapy.

5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

- Flash point** : - 104 °C
- Specific Hazards** : Sustained fire attack on vessels may result in a Boiling Liquid Expanding Vapour Explosion (BLEVE). The vapour is heavier than air, spreads along the ground and distant ignition is possible.
- Extinguishing Media** : Shut off supply. If not possible and no risk to surroundings, let the fire burn itself out.
- Protective Equipment for Firefighters** : Wear full protective clothing and self-contained breathing apparatus.
- Additional Advice** : Keep adjacent containers cool by spraying with water.



6. ACCIDENTAL RELEASE MEASURES

Observe all relevant local and international regulations.

- Protective measures** : Avoid contact with spilled or released material. Immediately remove all contaminated clothing. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. For guidance on disposal of spilled material see Chapter 13 of this Material Safety Data Sheet. Be ready for fire or possible exposure. Stay upwind and keep out of low areas. Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area and evacuate all personnel. Attempt to disperse the gas or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Monitor area with combustible gas meter.
- Clean Up Methods** : Allow to evaporate. Attempt to disperse the vapour or to direct its flow to a safe location, for example by using fog sprays. Otherwise treat as for small spillage.
- Additional Advice** : Risk of explosion. Inform the emergency services if liquid enters surface water drains. Vapour may form an explosive mixture with air. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.

7. HANDLING AND STORAGE

- General Precautions** : Avoid breathing of or contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet.
- Handling** : Avoid inhaling vapour and/or mists. Avoid contact with skin, eyes, and clothing. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge. The vapour is heavier than air. Beware of accumulation in pits and confined spaces. Extinguish any naked flames. Do Not smoke. Remove ignition sources. Avoid sparks.
- Storage** : Keep away from aerosols, flammables, oxidizing agents, corrosives and from products harmful or toxic to man or to the environment. Must be stored in a diked (bunded) well-



ventilated area, away from sunlight, ignition sources and other sources of heat. Vapours from tanks should not be released to atmosphere. Breathing losses during storage should be controlled by a suitable vapour treatment system.

- Product Transfer : Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge. Do not use compressed air for filling, discharging or handling.
Recommended Materials : For containers, or container linings use mild steel, stainless steel.
Container Advice : Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.
Additional Information : This product is intended for use in closed systems only.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits (OELs)

Table with 6 columns: Material, Source, Type, ppm, mg/m3, Notation. Rows include Butane, Propane and Ethyl mercaptan.

Exposure Controls The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits. Local exhaust ventilation is recommended.

Respiratory Protection : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are unsuitable (e.g., airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. Where respiratory protective equipment is required, use a full-face mask. Select a filter suitable for combined particulate/organic gases and vapors [boiling point <65 °C



- Hand Protection** : Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection: Neoprene rubber. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, and dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced.
- Eye Protection** : Chemical splash goggles (chemical mono goggles).
- Protective Clothing** : Chemical resistant gloves/gauntlets, boots, and apron. For spillage clean up use chemical resistant knee length boots. Where risk of splashing or in spillage clean up, use chemical resistant one-piece overall with integral hood, PVC.
- Monitoring Methods** : Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate. Examples of sources of recommended air monitoring methods are given below or contact supplier.

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance : Colourless gas, Liquid under pressure;
Odour : Unpleasant odour (marketable LPG)
Flash point : - 104 °C
Melting point : -189 °C
95% Boiling point : 5°C max
Vapour pressure : 485 kPa max @ 37.8 °C
Specific gravity : 0.57 @ 20 °C
Water solubility : Negligible.
Flammability limits : LEL : 2.2 % v/v; UEL : 9.8 % v/v
Volatile component : 100.0
Auto ignition temperature : 468 °C Approx
Vapour density (air =1) : 1.7 @ 15 °C

10. STABILITY AND REACTIVITY

- Stability** : Stable under normal conditions of use.
Conditions to Avoid : Heat, flames, and sparks.
Materials to Avoid : Strong oxidizing agents.
Hazardous Decomposition Products : Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases, including carbon monoxide, carbon dioxide and other organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.



11. TOXICOLOGICAL INFORMATION

- Basis for Assessment** : Information given is based on similar products, and/or components.
- Acute Inhalation Toxicity** : Low toxicity: LC50>5000 ppm / 1 hours, Rat
High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness, death.
- Repeated Dose Toxicity** : Cardiovascular system: chronic abuse of similar materials has been associated with irregular heart rhythms and cardiac arrest.
- Additional Information** High gas concentrations will displace available oxygen from the air; unconsciousness and death may occur suddenly from lack of oxygen. Rapid release of gases which are liquids under pressure may cause frost burns of exposed tissues (skin, eye) due to evaporative cooling.

12. ECOLOGICAL INFORMATION

Not available.

13. DISPOSAL CONSIDERATIONS

- Material Disposal** : Recover or recycle if possible.
- Local Legislation** : Disposal in Kenya should be in accordance with the *Environmental Management and Coordination (Waste Management) Regulations, 2006*.

14. TRANSPORT INFORMATION

UN Identification number	1075
Proper shipping name	Petroleum Gases, Liquefied
DG Class / Division	2.1
Hazchem code	2WE
Packaging Group	II

15. REGULATORY INFORMATION

Reference is made to the Kenyan *Factories & Other Place of Work (Hazardous Substances) Regulations, 2007*. Other regulations may apply to this material.



Kenya Petroleum Refinery Ltd

Liquefied Petroleum Gas

MSDS No: KPRL/MSDS/ LPG/01;
Date Issued: 31st October, 2007

16. OTHER INFORMATION

NFPA Rating (Health, Fire, Reactivity) : 1, 4, 0

MSDS Revisions : None.

MSDS Regulation : The contents in the MSDS are in fulfillment of the requirements of the *Factories & Other Place of Work (Hazardous Substances) Regulations, 2007*.

Disclaimer

The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.