

# SAFETY DATA SHEET

## LIQUEFIED PETROLEUM GAS



### 1. Identification of Substance or Mixture and of the Supplier

**Material Name** : Liquefied Petroleum Gas

**Other Names** : LPG, Petroleum gases, liquefied

**Recommended Use** : LPG is used as a domestic, commercial, industrial and automotive fuel, a feedstock in chemical processes  
Fuel Component, Fuel for engines. Blend component

**Restrictions of Use** : This product is intended for use in closed systems only.

**Suppliers Details** : **Attock Refinery Limited**  
P.O. Refinery, Morgah, Rawalpindi, Pakistan  
Telephone/Fax Number  
Tel: +92-51-5487041-45  
Fax: 92-51-5487093-4  
Email: info@arl.com.pk

**Emergency Phone Number** : +92-51-5487041

### 2. Hazard Identification

**GHS Classification** : **Flammable Gas,** Category 1  
**Aspiration Hazard,** Category 1  
**Carcinogenicity,** Category 1  
**Eye Damage/Irritation,** Category 2A  
**Germ Cell Mutagenicity,** Category 1  
**Skin Corrosion/Irritation,** Category 2  
**Toxic to Reproduction,** Category 2  
**Hazardous to the Aquatic Environment Long-term Hazard,** Category 2

**GHS Label Elements & Precautionary Statements**



: **Signal Word**  
Danger

#### **Hazard Statement (s)**

**H220** Extremely flammable gas  
**H280** Contains gas under pressure; may explode if heated

- H332** Harmful if inhaled
- H340** May cause genetic defects
- H350** May cause cancer
- H360** Possible risk of harm to the unborn child
- H373** May cause damage to organs through prolonged or repeated exposure: Inhalation
- H411** Toxic to aquatic life with long lasting effects

**Precautionary Statement (s) – Prevention**

- P102** Keep out of reach of children
- P201** Obtain special instructions before use
- P202** Do not handle until all safety precautions have been read and understood
- P210** Keep away from source of ignition, hot surface and open flames. No smoking
- P260** Do not breathe gas
- P273** Avoid release to the environment
- P280** Contains gas under pressure; may explode if heated
- P281** Use personal protective equipment as required

**Precautionary Statement (s) - Response**

- P332+P313** If skin irritation occurs: Get medical advice/attention.
- P337+P313** If eye irritation persists: Get medical advice/ attention.
- P362** Take off contaminated clothing and wash before reuse.
- P370+P378** In case of fire: Use foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only for extinction.
- P377** Leaking gas fire: Do not extinguish, unless leak can be stopped safely
- P381** Eliminate all ignition sources if safe to do so
- CGA-PG05** Use a back flow preventive device in the piping.
- CGA-PG12** Do not open valve until connected to equipment prepared for use.
- CGA-PG06** Close valve after each use and when empty
- CGA-PG11** Never put cylinders into unventilated areas of passenger vehicles.
- CGA-PG02** Protect from sunlight when ambient temperature exceeds 52°C (125°F).

**Precautionary Statement (s) – Storage**

- P403** Store in a well-ventilated place.
- P410** Protect from sunlight.

### **Precautionary Statement (s) – Disposal**

**P501** Dispose of contents/container to an approved waste disposal plant

#### **Other hazards**

: The vapour is heavier than air; beware of pits and confined spaces. Vapour may create explosive atmosphere. The vapour may have narcotic effect. Frostbite (cold burn). Product may release Hydrogen Sulphide: A specific assessment of inhalation risks from the presence of hydrogen sulphide in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances.

### **3. Composition / Information on Ingredients**

#### **Chemical Identity**

: Complex mixture of hydrocarbons consisting of mainly Propane and butane with carbon numbers predominantly in the C1 to C6 range.

#### **Common Name**

: LPG

#### **Composition Information**

<b>Name</b>	<b>CAS Number</b>	<b>Percent (%)</b>
Butanes	68477-69-0	45 - 70
Propane	74-98-6	20- 50
Ethane	74-84-0	<5
Propylene	115-07-1	<5

### **4. First-Aid Measures**

#### **Inhalation**

: If inhaled, remove from contaminated area. To protect rescuer, use an Air-line respirator or Self Contained Breathing Apparatus (SCBA). Be aware of possible explosive atmospheres. Apply artificial respiration if not breathing. Give oxygen if available.

#### **Ingestion**

: Due to product form and application, ingestion is considered unlikely

#### **Skin**

: Cold burns: Remove contaminated clothing and gently flush affected areas with warm water (30° C) for 15 minutes. It is recommended that warm water is applied to clothing before removing it so as to prevent further skin damage. Apply sterile dressing and treat as for a thermal burn. For large burns, immerse in warm water for 15 minutes. DO NOT apply any form of direct heat. Seek immediate medical attention.

#### **Eye Contact**

: Cold burns: Immediately flush with tepid water or with sterile saline solution. Hold eyelids apart and irrigate for 15 minutes. Seek medical attention.

## 5. Fire Fighting Measures

**Hazchem Code** : 2YE

2 Fine Water Spray

Y Risk of violent reaction or explosion. Wear full fire kit and breathing apparatus. Contain spill and run-off.

E Evacuation of people in and around the immediate vicinity of the incident should be considered.

**Suitable Extinguishing Media** : Do not extinguish fire unless the leakage can be stopped. Use dry chemical, CO2 or foam.

**Unsuitable Extinguishing Media** : DO NOT USE WATER JET; Direct water jet may spread the fire.

**Hazards from Combustion Products** : Under fire conditions this product may emit toxic and/or irritating fumes, smoke and gases including carbon monoxide, carbon dioxide and oxides of nitrogen.

**Specific Hazards during Fire Fighting** : Fight fire with normal precautions from a reasonable distance. Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Keep containers cool by spraying with water if exposed to fire. Avoid release to the environment.

**Decomposition Temperature** : Not Available

**Precautions in connection with Fire** : Temperatures in a fire may cause cylinders to rupture and internal pressure relief devices to be activated. Cool cylinders or containers exposed to fire by applying water from a protected location. Do not approach cylinders or containers suspected of being hot. This material is capable of forming explosive mixtures in air. Keep containers cool by spraying with water if exposed to fire. Avoid release to the environment.

## 6. Accidental Release Measures

**Personal Precautions, Protective Equipment and Emergency Procedures** : Shut off source of leak if safe to do so. Eliminate all ignition sources if safe to do so. Ensure adequate ventilation. Do not breathe vapour. Stay upwind/keep distance from source. In case of inadequate ventilation wear respiratory protection. Avoid all contact. Wear suitable protective clothing. Contaminated clothing should be thoroughly cleaned. The vapour is heavier than air; beware of pits and confined spaces. Danger

of flashback. Take precautionary measures against static discharge. Do not use sparking tools. Spillage can create tripping or slipping hazards for personnel, or skidding hazards for vehicles. Only trained and properly protected personnel must be involved in clean-up operations.

**Environmental Precautions**

: Avoid release to the environment. Contain the spillage. Any large spillage into watercourses must be alerted to the regulatory authority responsible for environmental protection or other regulatory body.

**Methods and Materials for Containment and Cleaning up**

: Ventilate area, Only trained and properly protected personnel must be involved in clean-up operations.

**Small scale:**

Contain spillages with sand, earth or any suitable adsorbent material. Allow small spillages to evaporate provided there is adequate ventilation. Transfer to a lidded container for disposal or recovery. Ventilate the area and wash spill site after material pick-up is complete

**Large scale:**

In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion. Notify police and fire brigade as soon as possible.

**7. Handling & Storage**

**Safe Handling**

: Eliminate sources of ignition. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. The vapour is heavier than air; beware of pits and confined spaces. Danger of flashback. Take precautionary measures against static discharge. Do not use sparking tools. Provide adequate ventilation, including appropriate local extraction if dusts, fumes or vapours are likely to be evolved. In case of inadequate ventilation wear respiratory protection. Wear suitable protective clothing. Do not breathe vapour. Avoid all contact. Wash hands and exposed skin thoroughly after handling. Do not eat, drink or smoke at the work place. Wash contaminated clothing before reuse. Product may release Hydrogen Sulphide: A specific assessment of inhalation risks from the presence of hydrogen sulphide in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances.

**Environmental precautions**

: Avoid release to the environment. Contain the spillage. Any large spillage into watercourses must be alerted to the regulatory authority responsible for environmental protection or other regulatory body.

**Safe Storage Conditions**

: Do not store near incompatible substances and sources of ignition. Cylinders should be stored: upright, prevented from falling, in a secure area; below 45° C, in a dry, well ventilated area constructed of non-combustible material with firm level floor (preferably concrete), away from areas of heavy traffic and emergency exits.

**Recommended Storage Materials** : For containers, use mild steel. For seals and gaskets, use compressed asbestos fiber or other materials specifically approved for use with this product. Spirally wound metal gaskets are also suitable

**Unsuitable Storage Materials** : With respect to metals, aluminum should not be used if there is a risk of caustic contamination of the product. Certain forms of cast iron are unsuitable. With respect to non-metallic materials, natural rubbers must not be used. Nitrile rubbers and certain plastics may also be unsuitable, depending on the material specification and intended use.

**Tank cleaning:** : Cleaning, inspection and maintenance of storage tanks is a specialist operation, which requires the implementation of strict procedures and precautions. These include issuing of work permits, gas-freeing of tanks, using a manned harness and lifelines and wearing air-supplied breathing apparatus. Prior to entry and whilst cleaning is underway, the atmosphere within the tank must be monitored using an oxygen meter and/or explosimeter.

**Other information** : Ensure that all local regulations regarding handling and storage facilities are followed. Where large quantities of liquefied petroleum gas are stored, emergency and disaster plans must be developed in conjunction with local authorities.

## 8. Exposure Control / Personnel Protection

### Occupational Exposure Limit Values

Component	CAS No	Value Type (Form of Exposure)	Control Parameters / Permissible Concentration	Basis
Propane	74-98-6	TWA	2500ppm	ACGIH
Butane	68477-69-0	TWA	800 ppm	ACGIH
Hydrogen sulphide	7783-06-4	TWA	10 ppm	ACGIH

TWA (Time Weighted Average): The average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day week.

**Biological Limit Values** : Benzene: S-Phenylmercapturic acid in urine - End of shift: 25 µg/g creatinine (ACGIH) t,t-Muconic acid in urine - End of shift: 500 µg/g

creatinine (ACGIH)

<b>Appropriate Engineering Controls</b>	: Engineering control measures are preferred to reduce exposure to Oxygen-depleted atmospheres. General methods include forced-draught ventilation, separate from other exhaust ventilation, separate from other exhaust ventilation systems. Ensure that all electrical equipment is flameproof.
<b>Respiratory Protection</b>	: Not normally required. Inhalation of LPG vapours should be minimized. If there is a risk of exposure to high vapour concentrations, respiratory protection / breathing apparatus should be worn.
<b>Eye Protection</b>	: If splashes are likely to occur, wear goggles or full-face visors.
<b>Hand Protection</b>	: Wear neoprene or nitrile rubber gloves or chrome leather. Gloves must maintain flexibility down to the atmospheric boiling point of this product. It may be necessary to increase frequency of changing gloves if immersion or prolonged contact is likely
<b>Body Protection</b>	: Protective footwear should be worn when handling cylinders. If splashes are likely to occur, wear long-sleeved overalls made of cotton (100%) or other natural fibers.
<b>Environmental exposure controls</b>	: No specific measures. Because of its high volatility, LPG is unlikely to cause ground or water pollution.

## 9. Physical & Chemical Properties

<b>Physical State</b>	: Liquefied gas
<b>Flammability</b>	: Flammable
<b>Color</b>	: Colorless
<b>Odor</b>	: Hydrocarbon, Distinctive and unpleasant pungent smell
<b>Boiling Point Range °C</b>	: -40 to -1
<b>Specific Gravity @ 15.6°C/ 15.6 °C</b>	: 0.506 - 0.583
<b>Vapor Pressure, psi at 37.8°C]</b>	: 110 upto 130
<b>Vapour density (air=1) at 15°C</b>	: 1.7 to 2
<b>Auto-ignition temperature °C</b>	: 410 – 540
<b>Upper Flammability limit %</b>	: 11
<b>Lower Flammability limit %</b>	: 1.8

## 10. Stability & Reactivity

<b>Chemical Stability</b>	: Stable under recommended conditions of storage
<b>Conditions to Avoid</b>	: Avoid heat, sparks, open flames and other ignition sources



**Incompatible Products** : Incompatible with oxidizing agents (e.g. hypochlorite), acids (e.g. nitric acid), heat and ignition sources. Do not use natural rubber flexible hoses. Also incompatible (potentially violently) with oxygen, halogens and metal halides. Compatible with most common metals.

**Hazardous Decomposition Products** : This material will not decompose to form hazardous products other than that already present.

## **11. Toxicological Information**

**Toxicology Information** : Health hazard summary Asphyxiant. Symptoms of exposure are directly related to displacement of oxygen. As the amount of oxygen inhaled is reduced from 21-14% volume, the pulse rate may accelerate and the rate and volume of breathing may increase. The ability to maintain attention and think clearly is diminished, muscular co-ordination is somewhat disturbed. As oxygen decreases from 14- 10% volume, judgment becomes faulty, severe injuries may result in no pain. Muscular effort may lead to rapid fatigue. Further reduction to 6% may result in nausea and vomiting. Ability to move may be lost. Permanent brain damage may result even after resuscitation from exposure to this low level of oxygen. Below 6% breathing is in gas convulsion may occur. Inhalation of a mixture containing no oxygen may result in unconsciousness from the first breath and death may follow in minutes.

**Acute Toxicity – Oral**

LD50 :( Rat) : 682 mg/kg

**Acute Toxicity – Inhalation**

LD50 :( Rat) : 2770 mg/l / 4h

**Acute Toxicity – Dermal**

LD50 :( Rat) : 226 mg/kg.

**Ingestion** : Ingestion is considered unlikely due to product for.

**Inhalation** : Asphyxiant. Effects are proportional to oxygen displacement. Acts as a simple asphyxiant by displacing oxygen in the lungs thereby diminishing the supply of oxygen to the blood and tissues. May cause sensitization by inhalation.

**Skin** : Direct contact with the liquefied material or escaping compressed gas may cause cold burns similar to frostbite injury. Not a skin sensitizer.

**Eye** : Direct contact with evaporating liquid may result in cold burns, similar to frostbite injury, with possible permanent damage.

**Respiratory Sensitization** : Not expected to be a respiratory sensitizer



- Skin Sensitization** : Not expected to be a skin sensitizer
- Germ cell Mutagenicity** : May cause genetic defects
- Carcinogenicity** : May cause cancer. Classified as a Known or presumed human carcinogen.
- Reproductive Toxicity** : May damage the unborn child.
- Aspiration Respiratory Organs Hazard** : The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

## **12. Ecological Information**

- Ecotoxicity** : Vaporized liquefied petroleum gas is heavier than air, and can cause pockets of oxygen-depleted atmosphere in low-lying areas. It does not pose a hazard to the ecology, unless the gas/air is ignited.
- Biodegradability Persistence/ Degradability** : Oxidizes rapidly by photochemical reactions in air
- Mobility** : Evaporates extremely rapidly from water or soil surfaces. Disperses rapidly in air.
- Bioaccumulative Potential** : Does not bio accumulate
- Other Ecological Information** : In view of the high rate of loss from solution, the product is unlikely to pose a significant hazard to aquatic life.

## **13. Disposal Considerations**

Dispose of waste according to applicable local and national regulations. Labels should not be removed from containers until they have been cleaned. Advice flammable nature. Empty containers may contain flammable residues. Containers should be cleaned by appropriate methods and then reused or disposed of by landfill or incineration as appropriate. Do not pierce or burn, even after use. Wastes including emptied containers are controlled wastes and should be disposed of in accordance with all applicable local and national regulations.

## **14. Transport Information**

**Hazard Class**  
2.1

**U.N. Number**

1075

**Packaging Group**

Packing Group not applicable

**Label**

Flammable Liquid

**Other information:**

Transport of this product on Public transport is forbidden.

**15. Regulatory Information**

Classified as Hazardous according to the Globally Harmonized System of classification and labeling of chemicals (GHS) including Work, Health and Safety regulations.

**OSHA Hazards** : Flammable liquefied petroleum Gas, highly toxic by ingestion, Moderate skin irritant, severe eye irritant, Carcinogen.

**16. Other Information including Information on Preparation and revision of the SDS**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information 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 process.