

1. Identification of the Substance/ Preparation and of the Company

Product Name: **Butane**

Chemical Formula: C_4H_{10}

Company Identification: Energas Limited
Westmorland Street
Hull HU2 0HX

Emergency Telephone No: 01482 329333

2. Composition/ Information on Ingredients

Substance/ Preparation: Substance

Components/ Impurities:

Liquefied Butane Gas consisting predominantly Of C_4 Hydrocarbons (butane and butadiene). A small amount (<50ppm) of ethyl mercaptan Or similar odouring agent is commonly added to Assist in leak detection. Contains <0.1% 1,3 Butadiene.

Hazardous Components:

Hydrocarbon, c3-4 rich, petroleum distillate.

CAS Number: 00106-97-8
EEC Number: 601-004-00-0 (from EINECS)

3. Hazardous Properties

- R12 Extremely Flammable (F+). >90%
- Readily forms an explosive air-vapour mixture at ambient temperature.
- Vapour is heavier than air and may travel to remote sources of ignition (e.g. along drainage Systems, into basements, etc.).
- Liquid leaks generate large volumes of flammable vapour (approx 250: 1)
- Cold burns (frostbite) will result from skin/eye Contact with liquid.
- Liquid release or vapour pressure jets present a risk of serious damage to the eyes.
- Abuse involving wilful inhalation of very high concentrations of vapour even for short periods can produce unconsciousness or might prove fatal. Inhalation may cause irritation to the nose and throat, headache, nausea, vomiting dizziness and drowsiness.
In poorly ventilated or confined spaces, unconsciousness or asphyxiation may result.

4. First Aid Measures

Inhalation: Remove the affected person to fresh air. If breathing has stopped administer artificial respiration. give external cardiac massage if necessary. If the person is breathing but unconscious place them in the recovery position. Obtain medical assistance immediately.

Skin:

In case of cold burns, flush copiously with water to normalise temperature. Cover the burns with sterile dressings. Do not apply ointments or powders. Obtain medical assistance immediately.

Eyes:

Cold burns should be flushed with water to normalise temperature. Cover the eye with a sterile dressing

Ingestion:

Ingestion is not considered a potential route of exposure.

5. Fire Fighting Measures

These materials are delivered, stored, and used at temperatures above their flash point. Avoid all naked flames, sparks, cigarettes, etc.

- **IN CASE OF FIRE, IMMEDIATELY ALERT THE FIRE BRIGADE.**
- Ensure an escape path is always available from any fire.
- If gas has ignited, do not attempt to to extinguish, but stop gas flow and allow to burn out.
- Use water spray to cool heat-exposed containers, and to protect surrounding areas and personnel effecting shut off.

Every precaution must be taken to keep containers cool to avoid the possibility of a boiling liquid expanding vapour explosion (BLEVE).

Pressurised containers are liable to explode violently when subjected to high temperatures.

Extinguishing Media

Large Fire.

- None. Product flow must be stopped and container cooled by water spray. Water fog should be used to assist approach to the source of the fire. Large fires should only be fought by the Fire Brigade.

- **DO NOT USE WATER JET.**

Small fire:

- Dry powder
- **DO NOT USE WATER OR FOAM.**

6. Accidental Release Measures

IMMEDIATE EMERGENCY ACTION:

- Clear people away to a safe place.
- Do not operate electrical equipment unless flameproof.
- Summon aid of emergency services.
- Treat or refer casualties if necessary.

FURTHER ACTION – FIRE:

IF SAFE:

- Stop product flow.
- Use dry powder or carbon dioxide extinguishers;
- Cool containers exposed to fire by water fog/spray.

FURTHER ACTION – SPILLAGE:

IF SAFE:

- Extinguish naked lights e.g. cigarettes- AVOID MAKING SPARKS.
- Position fire fighting equipment.
- Try to stop the flow of liquid product.
- Cover drains and disperse vapour with water spray.

Note: vapour may collect in confined spaces.

7. Handling and Storage

GENERAL

Cylinders containing Energas Liquefied Butane gas are designed to give vapour offtake.

Cylinders must be stored and used in the vertical position.

HANDLING PRECAUTIONS

- No Smoking or Naked Lights.
- Ensure good ventilation.
- Avoid inhalation of vapour.
- Avoid contact with liquid and cold storage containers.
- When handling cylinders wear protective footwear and suitable gloves.
- Avoid contact with eyes.
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STORAGE CONDITIONS

- No Smoking or Naked Lights.
- Store and use only in equipment / containers designed for use with this product.
- Store and dispense only in well-ventilated areas away from heat and sources of ignition.
- Containers must be properly labelled.
- Do not remove warning labels from containers.

FIRE PREVENTION

- Ensure equipment is electrically bonded and earthed to prevent static accumulation.
- Explosive air/ vapour mixture may form at ambient temperature.

Note: Product spilt on clothing may give rise to delayed evaporation and subsequent fire hazard.

8. Exposure Controls/ Personal Protection

The following limits are taken from the Health & Safety Executive Guidance note EH40 Occupational Exposure Limits 2002

Occupational Exposure Limits:

BUTANE: LTEL; 1450/mg /cm (600ppm)

8-hour TWA ref Period.

STEL; 1810 mg/cm (750 ppm)

15 min ref period.

RECOMMENDED PROTECTIVE CLOTHING

Protective clothing:

- Wear suitable clothes and overalls to prevent cold burns and frostbite(neoprene or LPG resistant gauntlet gloves.)
- In filling operations wear protective clothing including impervious gloves, safety goggles or face shield to BS EN 166,167 & 168.
- When handling cylinders wear protective footwear to BS EN 345.

Respiratory Protection.

If operations are such that significant exposure to vapour may be anticipated, then suitable approved respiratory equipment should be worn.

The use of respiratory equipment must be strictly in accordance with the manufacturers instructions and any statutory requirements governing its selection and use.

9. Physical and Chemical Properties

Appearance:	Colourless liquefied gas.
Odour:	Odourless, odorant added to provide a distinctive smell.
Boiling Point:	-0.5°C
Flash Point:	< 60°C (PMCC)
Flammability Range:	2% – 9% in air
Auto - flammability:	410- 550 °C
Vapour Pressure @ 20°C:	2.1 bar
Specific Gravity of (Liquid):	0.575 at 15°C
Specific gravity of (Vapour):	2.0 at 15°C (Air = 1.0)

10. Stability and Reactivity

Energas Liquefied Butane gas is stable at ambient temperatures. Hazardous polymerisation will not occur.

CONDITIONS TO AVOID.

- Sources of Ignition.
- Storage at above 50°C

MATERIALS TO AVOID.

- Strong oxidising agents (e.g. chlorates, which may be used in agriculture, peroxides.

DECOMPOSITION PRODUCTS.

The substances arising from the thermal decomposition of these products will largely depend upon the conditions bringing about the decomposition. The following hazardous substances may be expected from normal combustion:

- Carbon Dioxide.
- Carbon Monoxide.

11. Toxicological Information

Eye Contact.

Contact with ENERGAS Liquefied Butane Gas will present a risk of serious damage to the eyes.

Skin Contact.

Contact with ENERGAS Liquefied Butane Gas will cause cold burns and frostbite to the skin.

Inhalation.

Low vapour concentrations may cause nausea, dizziness, headaches and drowsiness.

May have a narcotic effect if high concentrations of vapour are inhaled. High vapour concentrations may produce symptoms of oxygen deficiency which, coupled with central nervous system depression, may lead to rapid loss of consciousness.

ABUSE:

Under normal conditions of use the product is not hazardous: however, abuse involving deliberate inhalation of high concentrations of vapour, even for short periods, can produce unconsciousness and / or result in a sudden fatality.

Carcinogenicity

No known behaviour.

Mutanagenicity

No known behaviour

Tetratogenicity.

No known behaviour

12. Ecological Information

This product causes no known ecological damage.

AIR

Energas Liquefied Butane Gases are mixtures of volatile components which when released to air will react rapidly with hydroxyl radicals and ozone to form carbon dioxide and water.

WATER

If released to water the product will rapidly evaporate.

SOIL

If released to soil the product will rapidly evaporate.

Mobility

Spillages are unlikely to penetrate the soil.

Persistence and degradability.

Unlikely to cause long term adverse effects in the environment.

Bio accumulative potential

This material is not expected to bioaccumulate.

Aquatic toxicity

Unlikely to cause long term effects in the aquatic environment.

13. Disposal Considerations

Energas cylinders are the property of Energas Ltd and should be returned to the local dealer/ stockist.

Users are recommended to contact their local Energas representative when they wish to dispose of surplus quantities of Energas Liquefied Butane Gas.

Do not discharge product into areas where there is risk of forming an explosive mixture with air.

Empty packages may contain some remaining product. Hazard labels are a guide to the safe handling of empty packaging and should not be removed.

Empty containers represent a fire hazard as they may contain flammable product residues and vapour. Never incinerate, crush, weld, solder or braze empty containers.

14. Transport Information

Dangerous for Conveyance

UN No.	:	1011
Class/ Division	:	2.1
ADR/RID item	:	2F
Emergency Action Code	:	2YE
Hazard Identification No.	:	23
CEFIC Tremcard No.	:	27B/20g41
Labelling ADR	:	Model No 2.1: Flammable gas.

Avoid transport on vehicles where the load space is not separated from the driver's compartment.

Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or emergency.

Ensure all cylinder valves are closed and not leaking and the load is firmly secured and complies with the applicable regulations.

15. Regulatory Information

This material has been classified according to the requirements of the Dangerous Substances Directive 67/548/EEC as last amended by the 28th Adaptation to the Technical Progress and the Dangerous Preparations Directive 1999/45/EEC as amended by the 1st Adaptation to the Technical Progress.

EC Classification: F+; R12

- Symbols - road transport symbols are used and selected to the most stringent product classification.

EC or ADR – Model No 2.1: Flammable gas.

- Risk Phrases

R12 Extremely flammable

- Safety Phrases

S2 Keep out of the reach of children.

S9 Keep container in a well-ventilated place

S16 Keep away from sources of ignition –

NO SMOKING

S33 Take precautionary measures against static Discharges.

Note: closed refillable cylinders and non- refillable cylinders within the scope of EN417, for fuel gases which are only released for combustion, only have to bear an appropriate symbol (Supply or Carriage) and the risk and safety phrases concerning flammability. Such cylinders are exempted from carrying the risk and safety phrases relating to health effects.

16. Other Information

Valve Connection: 20/21 mm

Ensure all national/ local regulations are observed.

Ensure all users of this product understand the flammability hazard and hazards of asphyxiation.

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

Details given in this document are believed correct at the time of going to press.

The references set out below give further information: Carriage of Dangerous Goods and Use of transportable Pressure Equipment Regulations 2004.

- Chemical Hazard Information and Packaging for Supply Regulations 2002 (CHIP3)
- Control of Major Accident Hazards Regulations 1999.
- Dangerous Substances and Explosive Atmosphere Regulations 2002.
- Dangerous Substances (Notification and Marking of Sites) Regulations 1990.
- Health and Safety at Work Act 1974
- Management of Health and Safety at Work Regulations 1992.
- Notifications of Installations handling Hazardous Substances Regulations 1982.
- Pipelines regulations 1996
- The Pressure Systems (Safety) Regulations 2000.

Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

Refer to Energas Limited General Safety and Handling Data Sheet for further details.

CYLINDER IDENTIFICATION LPGA
GROUND COLOUR: NIGHT BLUE (RAL 5022)(Green or White Valve Shroud) 20 mm Valve
PALE GREEN (RAL 6021) (RED SHROUD) 21 mm Valve

ENERGAS GENERAL SAFETY AND HANDLING DATA

1. GENERAL

Only trained persons should handle compressed gases.
Observe all regulations and local requirements regarding the storage of containers.
Do not remove or deface labels provided by the supplier for the identification of the container contents.
Ascertain the identity of the gas before using it.
Know and understand the properties and hazards associated with each gas before using it.
When doubt exists as to the correct handling procedure for a particular gas contact the supplier.

2 HANDLING AND USE

Wear stout gloves.
Never lift a container by the cap or guard unless the supplier states it is designed for that purpose.
Use a trolley or other suitable device or technique for transporting heavy containers, even for a short distance.
Where necessary wear suitable eye and face protection. The choice between safety glasses, chemical goggles, or full-face shield will depend on the pressure and nature of the gas being used.

Where necessary for toxic gases see that self-contained positive pressure breathing apparatus or full face air line respirator is available in the vicinity of the working area.
Employ suitable pressure regulating devices on all containers when the gas is being emitted to systems with a lower pressure rating than that of the container.

Ascertain that all electrical systems in the area are suitable for service with each gas.

Never use direct flame or electrical heating devices to raise the pressure of a container. Containers should not be subjected to temperatures above 45°C.

Never re-compress a gas mixture without consulting the supplier. Never attempt to transfer gases from one container to another.

Do not use containers as rollers or supports, or for any other purpose than to contain the gas as supplied.

Never permit oil, grease or other readily combustible substances to come into contact with valves of containers containing oxygen or other oxidants.

Keep container valve outlets clean and free from contaminants, particularly oil and water.
Do not subject containers to abnormal mechanical shocks which may cause damage to their valves or safety devices.

Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier.

Close the container valve whenever gas is not required even if the container is still connected to the equipment.

3 STORAGE

Containers should be stored in a well-ventilated area. Some gases will require a purpose built area.

Store containers in a location free from fire risk and away from sources of heat and ignition. Designation as a no smoking area may be desirable.

Gas containers should be segregated in the storage area according to the various categories.

The storage area should be kept clear and access should be restricted to authorised persons only, the area should be clearly marked as a storage area and appropriate hazard warning signs displayed (Flammable Toxic etc.).

The amount of flammable or toxic gases should be kept to a minimum.

Flammable gases should be stored away from other combustible materials.

Containers held in storage should be periodically checked for general condition and leakage.

Containers in storage should be properly secured to prevent toppling or rolling.

Vertical storage is recommended where the container is designed for this.

Container valves should be tightly closed and where appropriate, valve outlets should be capped or plugged. Protect containers stored in the open against rusting and extremes of weather.

Containers should not be stored in conditions likely to encourage corrosion.

Store full and empty containers separately and arrange full containers so that the oldest stock is used first.

PRODUCTION SITE ADDRESSES

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FOR FURTHER INFORMATION CONTACT YOUR NEAREST DISTRIBUTION CENTRE