

Material Safety Data Sheet Butane

1. Identification of the substance or the preparation and of the company

Product name: **Butane** (commercial butane).
Product usage: Industrial and domestic applications for heating, cooking and specific production processes.
Product type: Extremely flammable liquefied gas.
Supplier: S.A. Shell Gas (LPG) Belgium NV
Address: Jan Olieslagerslaan, 41, B-1800 Vilvoorde
Telephone number: +32 (0) 2 246 00 00
Emergency telephone number: +32 (0) 2 216 74 69 (24/24 hours, used for Belux)

2. Composition and information about the components

Description of preparation: Formula: C_4H_{10} (N° CAS: 106-97-8 / EC index number: 203-448-7).
Complex mixture of hydrocarbons consisting mainly of butane (normal butane and isobutane) and butenes plus some C_3 , C_5 and higher hydrocarbons.
Low concentrations of sulphur, hydrogen sulphide and thiols may be present. The concentration of 1.3 butadiene, < 0.01%, is not considered to cause any harmful effects as mentioned.
Product may also contain one of the following additives: odorants (usually ethyl mercaptan), anti-freeze (methanol).
Synonyms: Liquefied Petroleum Gas / LPG).

3. Identification of the risks

EU classification: Extremely flammable.
Risks to health: Although this is unlikely in normal use, deliberate inhalation of very high concentrations of vapour, even for a short time, can lead to loss of consciousness or be fatal.
Skin contact with liquid butane gas can cause frostbite or cold burns.
Physical/chemical risks: This product is delivered, stored and used at temperatures that lie above the flash point. Since butane gas vapour is heavier than air, the vapour will spread along the ground and concentrate in low-lying places. This makes ignition by distant ignition sources possible.
Explosive air/vapour mixtures can form at ambient temperature.
Risks for the environment: No specific risks under normal conditions of use.



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4. First aid measures

Protection of first aiders:	TAKE PRECAUTIONS TO PREVENT RISKS OF FIRE, EXPLOSION AND INHALATION.
Inhalation:	If exposure to vapour, mist or fumes cause drowsiness, headache, blurred vision or irritation of the eyes, nose or throat, bring the victim into the fresh air. Keep the patient warm and calm. Seek medical assistance if any symptoms persist. Unconscious victims should be placed in the recovery position. Check breathing and pulse rate regularly; if breathing stops or is considered inadequate, apply artificial respiration, preferably mouth-to-mouth. Resuscitate if necessary. Request immediate medical assistance.
First aid – skin and eyes:	Flush eyes and/or skin with abundant quantities of lukewarm water. Request immediate medical assistance. Exposure to liquid gas can cause eye and skin injuries similar to burns. Remove clothing (unless this is stuck to skin). Before washing clothing, this should be rinsed with abundant quantities of water. Do not heat the affected skin quickly, but warm it gradually. Treat as a thermal burn by just covering with a sterile gauze dressing. Do not use ointment or powders.
First aid - Swallowing:	In the unlikely event of a patient having swallowed liquid gas, seek medical assistance immediately.
Advice to the doctor:	Treatment should be based on the symptoms.

5. Firefighting measures

Specific risks:	At ambient temperature, as a flammable gas, butane is heavier than air, which can spread over great distances to reach an ignition source. The flame can spread very fast and a flash is always possible. Containers (tanks, bottles or cylinders) filled with liquid butane can fail under the influence of flame, which can lead to a BLEVE (Boiling Liquid Expanding Vapour Explosion). Hazardous combustion products are mainly carbon monoxide, nitrogen oxides, sulphur oxides and unburnt hydrocarbons.
Extinguishing agents:	Water, carbon dioxide, dry powder.
Firefighting measures:	If possible, turn off the electricity supply. If possible, turn off the gas supply and let the fire burn itself out. Do not extinguish the fire if the gas supply is not switched off, or cannot be switched off immediately after extinction. Otherwise, another explosion could occur. Large fires may only be fought by professional firefighters. Extinguish small fires with a portable fire extinguisher, preferably suitable for classes A (solids), B (liquids) and C (gases). Use a water mist to keep tanks and gas bottles cool. Restrict the number of parties working in the vicinity of the fire and evacuate the surrounding area.
Precautions against fire and explosion:	Smoking must be prohibited in and close to storage areas, during loading or unloading or during installation work. Cover the inlet to the drainage network in the vicinity of the works on the gas plant. (Vapour is heavier than air and can spread over long distances along the ground). During unloading of butane gas into tanks, the potential difference must be eliminated. No flammable material may be stored around the tank.



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6. Measures in the event of accidental release of the substance or preparation

Fire precautions:	<p>Remove all potential sources of ignition in the surrounding area, cover the inlet of the drainage network and evacuate the personnel</p> <p>Do not enter enclosed spaces, and ventilate the contaminated areas thoroughly (using explosion-proof equipment) to prevent the formation of an explosive atmosphere.</p> <p>Before allowing other personnel into the surrounding area, have the atmosphere tested for vapour with suitable detection equipment by an expert, to guarantee that working conditions are safe.</p>
Environmental precautions:	no specific measures.
Limited leakage:	If possible, remove the leak without taking risks for the personnel, and allow it to evaporate. Do not spray water in the direction of butane in the liquid phase.
Large leaks:	<p>Try to spread the gas or direct its flow to a safe area (free of sources of ignition), for example using a water mist.</p> <p>Do NOT remove the gas by allowing it to flow or guiding it to the drainage network.</p> <p>Otherwise, treat as with limited leakage.</p> <p>The local authorities must be warned if leakage cannot be controlled.</p>

7. Use and storage

Use:	<p>Only use in well-ventilated places and away from sources of heat and ignition (in accordance with the electrical classification). Prohibit smoking and naked flames during filling. Ensure that the authorised filling level is not exceeded. Personnel must be instructed in the safe use of butane gas and how to act in unsafe situations.</p> <p>The equipment used on and around the butane tank must be explosion-proof.</p> <p>Do not drag, push or roll gas bottles, but use a suitable hand-trolley to move them. Use a suitable regulator to connect a gas bottle to the pipework and with a low-pressure system.</p> <p>Never heat a pressurized container in any way in order to increase its flow rate.</p> <p>Never transfer gas bottles in a not ventilated space such as a car boot or inside a van, because a leak can cause fire, explosion or asphyxiation.</p> <p>Do not use compressed air to fill, unload or use the product.</p>
Storage:	<p>Butane gas is only stored in well-ventilated places, under pressure in tanks or bottles, which are suitable and approved for this product, at a sufficient distance from property and storage of hazardous materials.</p> <p>Prohibit smoking, naked flames, heat and other sources of ignition in the vicinity of this storage area.</p> <p>The tanks or bottles used, the storage site, all associated equipment and the location must comply with the legal requirements.</p> <p>Do not enter a butane tank. If it is necessary to enter a tank, contact the specialized firm.</p> <p>The ground level on which the gas is stored must be equal to or higher than the ground level around the storage site.</p> <p>Store out of the reach of children and inexperienced users.</p>
Other information:	<p>Take account of the buoyancy of the bottles and tanks on installation, use or storage of empty or full gas containers in places that are liable to flooding.</p> <p>Where large quantities of liquid gas are to be stored, draw up an emergency and disaster plan in consultation with the local authorities.</p>



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8. Measures to control exposure/individual protection

Technical precautions:	Only use in well-ventilated rooms. If necessary, provide ventilation by extraction at the source to prevent any accumulation. If the product is used regularly in situations where there is a potential risk of leakage, the electrical equipment must meet the requirements imposed by ATEX directives.
Control parameters:	No threshold values for exposure to the asphyxiating gas, which does not, in itself, have any physiological consequences but reduces the level of oxygen in the air inhaled.
Breathing protection:	Protective breathing apparatus is normally not required; instead, prevent and avoid high concentrations of butane gas in the air. Prevent long-term inhalation of vapour and ensure good ventilation.
Hand protection:	If contact is possible with liquid gas, wear gloves designed for use with LPG such as nitril rubber, neoprene or chrome leather, in accordance with EN 374 and EN 420.
Eye protection:	Safety goggles of face mask if splashing could occur.
Skin protection:	Safety shoes or boots in accordance with EN 345. If contact is possible with liquid gas: wear clothing that covers the body well, made of cotton, other natural non-static fibres or in accordance with EN 1149-1 and EN 533 (optionally EN 368 and EN 343).

9. Physical and chemical characteristics

State of aggregation:	Liquefied gas.
Colour:	Colourless.
Odour:	Naturally odourless, after odorization a strong, unpleasant characteristic smell.
Grammolecule mass:	approx. 58.12 g/mol.
Gas density:	heavier than air.
Boiling point:	Approx. -1°C.
Flammability:	Extremely flammable
Vapour pressure:	Approx. 345 kPa (absolute) at 20°C
Density:	Approx. 575 kg/m ³ at 15°C.
Flash point:	Approx. -40°C.
Upper explosion risk limit:	Approx. 8.5% (V/V).
Lower explosion risk limit:	Approx. 1.8% (V/V).
Spontaneous combustion temp.:	365°C
Explosive characteristics:	In use, it can form a flammable vapour/air mixture.
n-Octanol/water partition coefficient:	Log/Pow 2.8 (estimated value).
Solubility in water/grease:	Insoluble

10. Stability and reactivity

Stability:	Stable.
Conditions to prevent (stability):	Heat, flames and sparks and proximity of highly oxidising substances.
Hazardous products of decomposition:	Carbon monoxide, carbon dioxide, poly aromatic hydrocarbons, unburned hydrocarbons, non defined organic and inorganic compounds, nitrogen oxide and soot particles.



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11. Toxicological information

Basis for the assessment:	There is no toxicological product-specific data. The information given is based on data about the components and the toxicology of similar products. No long-term tests are known to have been carried out on chronic consequences concerning carcinogenic and mutagenic effects; the concentration of 1.3 butadiene, < 0.01%, is not considered to cause any harmful effects as mentioned. The other components have not been linked to possible carcinogenic or mutagenic effects.
Swallowing:	No data available.
Skin irritation:	No data available.
Inhalation:	LC50 > 5mg/l (gas). Low concentrations of vapour can cause nausea, dizziness, headache and drowsiness. Can have a narcotic effect if high concentrations are inhaled. High concentrations of vapour can result in symptoms of lack of oxygen which, together with depression of the central nervous system, can quickly lead to loss of consciousness. In normal use, the product is not dangerous; incorrect use, in which very high concentrations of vapour are inhaled, even for short periods of time, can result in loss of consciousness and/or sudden death.

12. Ecological information

Basis for the assessment:	No ecotoxicological information has been produced for this specific product. This information is based on data about the components and ecotoxicological data for similar products.
Mobility:	Evaporates very quickly from water or ground surfaces. Spreads very quickly in air.
Persistence/biodegradability:	Oxidises quickly through photochemical reactions in the air.
Bioaccumulation:	Bioaccumulation improbable.
Ecotoxicity:	Low acute toxicity for mammals improbable.
Other information:	Due to its high volatility, the product poses no danger to the aquatic environment.

13. Instructions for disposal

Precautions:	See section 8. Do not attempt to dispose of residual waste or of unused quantities.
Contaminated packaging:	Disposal activities, such as degassing and dismantling, may only be carried out by approved LPG installers.



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14. Information about transport

UN number: 1965.
Exact technical name: Mixture of hydrocarbon gases, liquefied (not elsewhere specified) (Butane or mixture A, A01, A02 or A0).
Commercial name: Commercial butane.
ADR/RID/VLG: Class 2.
Classification code: 2F.
Hazard identification number: 23.

Kemler Board ADR/RID/VLG:



for transport in bulk



for transport in packages (gas bottles).

Label symbol of danger:



OTHER INFORMATION: Transport of this product by passenger aircraft is prohibited.

15. Legally required information.

Labelling conform EC – directive 67/548/CEE and 1999/45/CE admissible until 01-12-2010

EC label name: Butane.
EC classification: Extremely flammable
Warning text: R12 - Extremely flammable.
Safety recommendations: S2 - Keep out of reach of children.
S9 - Store in a well-ventilated place.
S16 - Keep away from sources of ignition. No smoking.
Follow-up the following recommendations if splashes are likely to occur
S36/37/39 – Wear appropriate working clothes (long-sleeved), suitable gloves (PVC, neoprene) and goggles or full-face visors

Symbols: F+: Extremely flammable.



EINECS (EC): 203-448-7



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Labelling conform EC - regulation 1272/2008 obligatory from 01-12-2010 on

Name product:	Propane.
Signal word code:	Danger
Indications of danger:	H 220: Extremely flammable gas (2.2/1)
Precautionary measures:	PREVENTION P 210: Keep away from heat/sparks/open flames/hot surfaces – No smoking. RESPONS P 377: Leaking gas fire: do not extinguish, unless leak can be stopped safely. P 381: Eliminate all ignition sources if safe to do so. STORAGE P 403: Store in a well-ventilated place.

Symbols:



EINECS (EG):	200-827-9
Cascode:	74-98-6

16. Other information

First edition:	27/06/1993.
Revision 10:	01/05/2009. Replaces previous editions. This edition is to be completely revised by 01/05/2012.
Other information:	(For filling in Belgium) The filling conditions for gas bottles are laid down in the Royal Decree of 7 December 1999 concerning the filling, distribution and labelling of gas bottles of liquefied petroleum (published in the M.B. of 29-12-1999). Butane tanks and gas bottles that are the property of a company that is part of the Shell Group (e.g. S.A. Belgian Shell N.V.) may only be filled by filling companies /centres approved by Shell. This information gives the health, safety and environmental aspects of the product based on current knowledge. The information given above is based on our current knowledge of this product. The purpose of this information is to describe the product in the light of the requirements imposed with regard to health, safety and the environment in accordance with 67/548/EEG, 1999/45/EG and 76/769/EEG.
References:	"Liquefied Petroleum Gas": Concawe, Brussels, June 1992 "Chemiekaarten, Gegevens voor veilig werken met chemicaliën" TNO, 2003 "AI-26; Veiligheidsinformatiebladen en werkpleketikettering", Sdu Uitgevers, 2 ^e herziene druk
Technical contact address:	The QHSSE Advisor of Shell Gas (LPG) Benelux.
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