Version 3 – 20.12.2017, replaces
version 2 – 28.05.2017

SAFETY DATA SHEET
FOR LPG

1. Product and company identification

1.1 Product Identifier

Product name
LPG

Registry code (DK)
Propane 1892267
Butane 1892275

Synonyms
Kosangas, Kosan Autogas, Kosan Propane, Kosan Butane, Kosan Mix, Kosan BioMix, Kosan Isobutane, bottled gas, F gas.

Index No.
Propane: 601-003-00-5
Butane/Isobutane: 601-004-00-0
LPG mix: 601-003-00-5/601-004-00-0

This product is exempted for registration under REACH re article 2(7)(b).

1.2 The product should only be used as described in section 1.2

Relevant identified uses: Fuel for domestic, commercial and industrial purposes and for combustion engines. Can also be used for aerosol propellant.

1.3 Details of the supplier of the safety data sheet

Kosan Gas a/s Hasselager Centervej 19-21 DK-8260 Viby J www.kosangas.dk	**Telephone** +45 8948 7700 **Email** post@kosangas.dk

1.4 Emergency telephone number

Kosan Gas emergency telephone +45 8948 7700	**Poison Information Centre (Bispebjerg Hospital)** +45 8212 1212

2. Hazard identification

2.1 Classification of the substance or mixture

Classification in accordance with regulation 1272/2008 (CLP): Flam. Gas 1 Press. Gas.

Hazard statements
H220 Extremely flammable gas
H280 Contains pressurised gas, may explode when heated

2.2 Label elements

CLP

Hazard symbols

Flammable

Gas under pressure

Signal word

Danger

Precautionary statements – general

P102 Keep out of reach of children.

Precautionary statements – preventive measures

P210 Keep away from heat/sparks/open fire/hot surfaces. No smoking.

P243 Take precautionary measures against static discharge.

Precautionary statements – response

P377 Fire from leaking gas: Do not extinguish, unless leak can be stopped safely.

P381 Eliminate all ignition sources if safe to do so.

Precautionary statements – storage

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

Precautionary statements – disposal

P501 Dispose of contents/container in accordance with local waste regulations.

2.3 Other hazards

High concentrations of gas will displace oxygen in air. This may lead to sudden loss of consciousness and death due to oxygen deficiency. Exposure to liquid LPG may cause cold burns on eyes and/or skin.Vapour is heavier than air and may drift along the ground and reach distant ignition sources which may lead to back firing. Static electricity may accumulate during pumping. Static electricity may result in fire.

3. Composition and ingredient information

3.1 Substances

LPG is treated under item 3.2.

3.2 Mixtures

Substances	Index no.	CAS/EC no.	CLP – 1272/2008	W/W %
Propane* Kosan BioMix*	601-003-00-5	74-98-6 200-827-9	Flam. Gas 1 Press. Gas; H220, H280	>92.5
Butane*	601-004-00-0	106-97-8 203-448-7	Flam. Gas 1 Press. Gas; H220, H280	>92.5
LPG mix* (Propane/butane) Kosan BioMix*	601-003-00-5 601-004-00-0	74-98-6 106-97-8	Flam. Gas 1 Press. Gas; H220	20-40 60-80
Isobutane	601-004-00-0	75-28-5 200-857-2	Flam. Gas 1 Press. Gas; H220	>95
1,3-Butadiene		203-450-8	Flam. Gas 1, Press Gas, Carc. 1A, Muta 1B, H220, H350, H340	<0,1
*Odorant/ Ethyl mercaptan	016-022-00-9	75-08-1	Flam. Liq.2, Aquatic Chronic 1, Acute Tox 4 // H225, H332, H400, H410	>10 PPM
*Odorant/Vigileak 2-Methylpropane-2-thiol/Dimethyl sulphide	200-800-2 200-846-2	75-66-1 75-18-3	Flam. Liq. 2:H225, Skin Sens. 1B;H317 Aquatic Chronic 2; H411 Eye Irit.2; H319	>6 PPM

Note: *Either ethyl mercaptan or Vigileak

4. First aid measures

4.1 Description of first aid measures

Inhalation
Move to fresh air. Keep the injured person under supervision.
Call the Poison Information Centre or a doctor immediately.

Skin Contact
Remove contaminated clothing, rings, watches etc., but not if they are adhering to the skin.
Wash/rinse with clean water. Seek medical attention if lasting discomfort.

Eye contact
Rinse with large amounts of water. If possible, remove any contact lenses. Protect the eyes with a sterile dressing. Seek immediate medical attention.

Ingestion
Not a likely exposure. Frostbite on lips and mouth must be rinsed with water.

Other information:

4.2 Most important symptoms and effects, both acute and delayed

Inhalation of gas may cause drowsiness, headache, blurred vision or irritation of the eyes, nose or throat. Continuous exposure can result in loss of consciousness and/or death.

4.3 Indication of any immediate medical attention and special treatment needed

Symptomatic medical attention. Show this safety data sheet to the doctor or emergency department.

5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Shut off the gas supply.
Large fire – water sprinkling/mist for cooling.
Small fire – powder extinguisher type ABC.

Unsuitable extinguishing media
Foam.
Avoid direct water on gas pool which causes a quick evaporation of the gas and an increased fire risk.

5.2 Special hazards arising from the substance or mixture

Risk of explosion on pressure rise in closed containers.
Risk of explosion (BLEVE) if pressurised containers are exposed to heat from fire. Cool the container using water or move to a safe place, if possible. Gas is heavier than air and may drift along the ground, drainage systems or ditches. Complete combustion produces carbon dioxide and water vapour. Incomplete combustion produces carbon monoxide, which is toxic.

5.3 Advice for firefighters

If there is a risk of exposure to fumes and flue gases, fire fighters should wear all-covering, fire-resistant clothing and self-contained breathing apparatus. Static electricity may accumulate during pumping. Static electricity may result in fire.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel
Evacuate the area. Shut off the gas supply if this can be done without risk.
Remove ignition sources – choose a safe place in relation to the wind direction.

6.1.2 For emergency responders
Evacuate the area. Shut off the gas supply. Remove ignition sources. Avoid gas leakage in confined areas like basements and drainage systems.

6.2 Environmental precautions

Avoid unnecessary emission to the surroundings – does not cause pollution to soil or water.

6.3 Methods and material for containment and clean-up
Shut off the gas supply. Leave the liquefied gas to evaporate so that the gas is rarefied into a safe concentration in the atmosphere. Check and mix the gas with water spray where appropriate. Ventilate gas thoroughly from confined spaces.

6.4 Reference to other sections
Information about suitable equipment, see section 8.

7. Handling and storage

7.1 Precautions for safe handling
Smoking and open fires are prohibited. LPG is intended for use in closed systems. Ensure adequate ventilation. Avoid inhalation of gas. Wear suitable personal protective equipment.

7.2 Conditions for safe storage, including any incompatibilities
The product should be stored safely and out of reach of children. To be kept only in closed and approved pressure containers. Use explosion-proof equipment. Handling systems must be earthed and have equipotential bonding. The vapours are heavier than air and can therefore accumulate in low-lying areas, such as vehicle inspection pits, basements, channels and wells, and reach sources of ignition far away. Placement below ground level is therefore not permitted. Empty containers that have not been cleaned should be treated as full containers. Do not remove labelling.Handling and storage of large amounts of LPG requires authority approval. See the local/national regulations for gas.

7.3 Specific end use
See point 1.2

Other information
Certain grades of rubber will be damaged by the gas. Contact the gasket supplier regarding the choice of rubber grade.

8. Exposure controls/ personal protection

8.1 Control parameters

Substance	Limit value – ppm
Propane	1000
Butane	800
LPG mix/Butane/Propane	800/1000
Isobutane	1000

Limit values – comment
The values of the American Conference Governmental Industrial Hygienists have been specified above as a guide.

8.2 Exposure controls/personal protection

8.2.1 Appropriate exposure control measures
LPG is handled in a closed system. Explosion-proof exhaust ventilation. Gas detectors.

8.2.2 Individual protection measures such as personal protective equipment
Protection of eyes/face
For protection of skin or eyes in case of direct contact with or splashes of gas, a face shield or protection glasses in line with EN 166 must be worn.

Protection of skin/hands
If there is a risk of direct contact or splashes, gloves in line with EN 374 must be worn.
The gloves must not become stiff at low temperatures and should be easy to remove.

Protection of skin/other
If there is a risk of direct contact or splashes, all-covering fire resistant clothing must be worn, to protect against frostbite and fire injuries.

8.2.3 Environmental exposure controls
None, since LPG is handled in closed systems.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

LEL = Lower Explosion Limit

Properties	Propane	Butane	LPG mix	Isobutane
Appearance	Colourless	Colourless	Colourless	Colourless
Odour	Odourless – distinct and unpleasant odour added	Odourless – distinct and unpleasant odour added	Odourless – distinct and unpleasant odour added	Odourless – distinct and unpleasant odour added
Odour threshold	Typically 20% of LEL	Typically 20% of LEL	Typically 20% of LEL	Not relevant
pH value	Not relevant	Not relevant	Not relevant	Not relevant
Melting/freezing point	Typically -187.6 to -138.3°C	Typically -187.6 to -138.3°C	Typically -187.6 to -138.3°C	Typically -187.6 to -138.3°C
Boiling Point	Typically -42°C	Typically -0.5°C	Typically -20°C	Typically -11°C
Flash Point	Typically -104°C	Typically < -50°C	Typically -104°C	Typically < -50°C
Evaporation Rate	Not relevant	Not relevant	Not relevant	Not relevant
Flammability	Inflammable	Inflammable	Inflammable	Inflammable
Upper-lower flammability or explosion limit	2.2-9.5 vol% gas in air	1.8-9 vol% gas in air	2.2-10 vol% gas in air	1.8-8.5 vol% gas in air
Vapour pressure at +40°C	Typically 13 bar (g)	Typically 3.2 bar (g)	Typically 9 bar (g)	Typically 4.8 bar (g)
Density, vapour kg/m^3 at 0°C and 1013 mbar	Typically 2.0	Typically 2.7	Typically 2.3	Typically 2.7
Relative density (air = 1)	Typically 1.6	Typically 2.1	Typically 1.9	Typically 2.1
Density, liquid kg/m^3 at 15°C	Typically 507	Typically 585	Typically 550	Typically 565
Solubility	Insignificant in water	Insignificant in water	Insignificant in water	Insignificant in water
Distribution coefficient (n-octanol-water)	Typically 1.815	Not determined	Typically 1.815	Not determined
Self-ignition temperature	Typically 450°C	Typically 420°C	Typically 450°C	Typically 494°C
Decomposition temperature	Not relevant	Not relevant	Not relevant	Not relevant
Gaseous viscosity	Not relevant	Not relevant	Not relevant	Not relevant
Explosive properties	Not relevant	Not relevant	Not relevant	Not relevant
Oxidising properties	Not relevant	Not relevant	Not relevant	Not relevant

9.2 Other information

Not relevant.

10. Stability and reactivity

10.1 Reactivity
Not reactive.

10.2 Chemical stability
Stable.

10.3 Possibility of hazardous reactions
Extremely flammable.

10.4 Conditions to avoid
Ignition sources – heat, flames, sparks.

10.5 Materials to avoid
Materials not approved for use with LPG.
Only use sealants and sealing materials documented to withstand LPG.

10.6 Hazardous decomposition products
Not relevant.

11. Toxicological information

11.1 Information on toxicological effects

Substance	Exposure	Species	Test	Result
Propane/Butane/Iso-butane	Inhalation	Mouse	LC50/2hr	1237 mg/L air

Inhalation
Non-irritating. Inhalation of concentrations above 10% may cause narcotic effects, headaches, nausea, visual disturbance and dizziness. Inhalation of high concentrations may affect the central nervous system and cardiac function. May cause loss of consciousness and death.

Skin
Non-irritating (vapour form). Frostbite from evaporation of liquefied gas.

Eyes
Non-irritating (vapour form). Frostbite from evaporation of liquefied gas.

Ingestion
Not relevant.

Repeated dose toxicity
Not known.

Carcinogenic
Not classified as a carcinogenic material (1,3-butadiene < 0.1%).

Mutagenic effects
Not considered mutagenic.

Reproductive toxicity
Not known.

11.2 Other information
LC50 (inhalation) low toxicity > 20 mg/l.

12. Ecological information

12.1 Toxicity

Substance	Test duration	Species	Test	Result
Propane/Butane/Isobutane	96 h	Fish	LC50	27.98 mg/L
Propane/Butane/Isobutane	48 h	Daphnia	LC50	14.22 mg/L
Propane/Butane/Isobutane	96 h	Algae	EC50	7.71 mg/L

LPG evaporates quickly on contact with water. No acute or chronic impact in practice.

12.2 Persistence and degradability

Substance	Biodegradability in the aquatic environment	Test	Result
Propane/Butane/Isobutane	Yes	Biodegradation test	100% after 385.5 h

Quick oxidation by photochemical reaction in air.

12.3 Bioaccumulative potential

Substance	Potentially bioaccumulative	LogPow	BCF
Propane/Butane/Isobutane	No	1.09	-

Not expected to bioaccumulate.

12.4 Mobility in soil
Not relevant since LPG is extremely volatile.

12.5 Results of PBT and vPvB assessment
Hydrocarbons in the product do not meet the criteria for PBT or vPvB evaluation.

12.6 Other adverse effects
Global warming potential (GWP100) for non-combusted gas 3.3

13. Disposal considerations

13.1 Waste treatment methods

Chemical waste group	EWC code	Waste type
Z	16 05 04	Gases in pressure containers (including halons) containing substances

The properties and applications of the product result in no waste being generated.

Special labelling
Used or empty containers should be returned to Kosan Gas.
Returned containers must be labelled in accordance with ADR rules.

NB: Returned containers must be labelled with:

14. Transport information

	Road transport – ADR			
	Propane	**Butane**	**LPG mix**	**Isobutane**
UN number	1965	1965	1965	1969
UN shipping name	Hydrocarbon gas mixture, liquefied n.o.s. (Mixture C)	Hydrocarbon gas mixture, liquefied n.o.s. (Mixture A)	Hydrocarbon gas mixture, liquefied n.o.s. (Mixture A1)	Isobutane
Hazard class/label	2.1			
Hazard number	23			
Packing group	Not relevant			
Environment hazard	No			
Special precautionary measures for the user	Do not throw containers or expose to shock. During use the container must be placed in the correct position.			

	Railway transport – RID			
	Propane	**Butane**	**LPG mix**	**Isobutane**
UN number	1965	1965	1965	1969
UN shipping name	Hydrocarbon gas mixture, liquefied n.o.s. (Mixture C)	Hydrocarbon gas mixture, liquefied n.o.s. (Mixture A)	Hydrocarbon gas mixture, liquefied n.o.s. (Mixture A1)	Isobutane
Hazard class/label	2.1			
Hazard number	23			
Railway classification	Hazard label 13			
Packing group	Not relevant			
Environment hazard	No			
Special precautionary measures for the user	Do not throw containers or expose to shock. During use the container must be placed in the correct position.			

	Transport by ship – IMDG			
	Propane	**Butane**	**LPG mix**	**Isobutane**
UN number	1965	1965	1965	1969
Proper shipping name	Hydrocarbon gas, mixture, liquefied, n.o.s. (Mixture C)	Hydrocarbon gas mixture, liquefied n.o.s. (Mixture A)	Hydrocarbon gas mixture, liquefied n.o.s. (Mixture A1)	Isobutane
Hazard class/label	2.1			
Packing group	Not relevant			
EMS	F-D, S-U			
Segregation group	None			
Sea polluting	No			
Special precautionary measures for the user	Do not throw containers or expose to shock. During use the container must be placed in the correct position.			
Bulk transport	Not relevant			

	Air transport – IATA			
	Propane	**Butane**	**LPG mix**	**Isobutane**
UN number	1965	1965	1965	1969
UN shipping name	Hydrocarbon gas, mixture, liquefied, n.o.s. (Mixture C)	Hydrocarbon gas mixture, liquefied n.o.s. (Mixture A)	Hydrocarbon gas mixture, liquefied n.o.s. (Mixture A1)	Isobutane
Hazard class/label	2.1			
Packing group	Not relevant			
Sea polluting	No			
Special precautionary measures for the user	Do not throw containers or expose to shock. During use the container must be placed in the correct position.			
Bulk transport	Not relevant			

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific to the substance or mixture

Must not be used by people under 18 years of age (see local laws and regulations).

15.2 Chemical safety assessment

No chemical safety assessment has been made.

16. Other information

Explanation of hazard statements

H220 Extremely flammable gas
H225 Highly flammable liquid and vapour
H280 Contains pressurised gas, may explode when heated
H317 May cause an allergic skin reaction
H319 Causes serious eye irritation
H332 Harmful if inhaled
H340 May cause genetic defects
H350 May cause cancer
H400 Very toxic to aquatic life
H410 Very toxic to aquatic life with long-lasting effects
H411 Toxic to aquatic life with long-lasting effects

This information is based on our existing knowledge and is intended to describe LPG in relation to health, safety, security and environmental requirements.