

**MATERIAL SAFETY DATA SHEET
LIQUEFIED PETROLEUM GAS (LPG)**



Article	Butane	Butane/Propane MIX	Butane/Propane/Propylene MIX
577	227gr		

(1) IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/FIRM

1.1 Liquefied petroleum gases, usually referred to with the acronym LPG, are gaseous hydrocarbons. They have several uses; the most common ones are: fuel for home and industrial use, fuel for internal combustion engines, petrochemicals, propellants, expandants, refrigerants.

- Name of the product : LIQUEFIED PETROLEUM GAS *
- Commercial names or synonyms : MIX A, A01, A02, A0, A1, B1, B2, B and C **
- CAS no. : 68476-85-7
- CEE no. : 270-704-2
- EINECS no. : 649-202-00-6
- ONU no. : 2037 – cartridges with valves
- KEMLER no. : 23

Notes:

- *- In the EINECS and ELINCS several substances are identified as “petroleum gases”, differing according to their origin. Their properties and features are usually analogous and are thus subject to the same classification and labelling requirements. The identification of the product and the selection of the most suitable classification is up to the producer/importer.
- ** -For the above mixes, the following commercial names are allowed for the designation of the item:

Butane for Mixes A, A01,A02 and A0

1.2 LPGs have several uses; the most common ones are: fuel for home, industrial, agricultural use, fuel for internal combustion engines, petrochemicals, propellants, expandants, refrigerants.

1.3 Identification of the Company/Firm

Responsible for commercial distribution: **KEMPER S.R.L.**

Full address: **Via Prampolini 1/Q, 43044 Lemignano di Collecchio,**

Phone number +39 0521-957111

Technician in charge of the draft of the SDS: **Francesco Fochi; uff.tecnico1@walkover.it**

1.4 Phone number for urgent calls **+39 0521-957111** (available 8 AM to 7 PM)

(2) DANGERS IDENTIFICATION**2.1 Classification of the substance**

Classification of the substance (Directive 67/548/CEE) is:

- **F+, R 12.**

It is an extremely flammable liquefied gas

Classification resulting from application Regulation 1272/2008:

- Class code for hazard category

PRESS. GAS

FLAM. GAS 1

CARC. 1B

MUTA. 1B

CAUTION

- the classification Carc 1B and Muta. 1B are not required, according to Note K for substances that contain less than 0.1% of 1,3-butadiene weight /weight. If the substance is not classified as a carcinogen or mutagen, at least include safety advice (P102-)P210-P403. As a result of the above, the following is only the details of the carcinogenic and mutagenic substances not classified.

Hazards indication code:

H220

H280

Hazard indication and R phrases:

H220: Extremely flammable gas

H280: Contains gas under pressure can explode if heated

P102: Keep out of reach of children

P210: Keep away from heat / sparks / open flames / hot surfaces. Do not smoke

P410 + P403: Store in a well ventilated area and protect from sunlight.

2.2 Marking elements:

Marking label for substances, packaged in refillable or not-refillable cartridges conform to EN 417 is making by:



GHS 02

(Flammable gas, hazard category 1)

danger

H220: Extremely flammable gas

P102: Keep out of reach of children

P210: Keep away from heat / sparks / open flames / hot surfaces. Do not smoke

P403: Store in a well ventilated

note

* The labeling is simplified under the exemption in Annex 1, Section 1.3.2.1 of the Regulation 1272/08.

2.3 Other dangers:

In the prescribed storage and use conditions, there is no risk for the users of the product. The following will provide information about other dangerous conditions which, although not define the classification of the substance, contributing to the danger of the same:

- In case of outflow, the fluid leaking from the container quickly evaporates, mixes with air and generates a risk of fire and/or explosion.
- It may create an explosive mix with air, especially in closed environments or in empty, not decontaminated vessels.
- The product is not deemed toxic, yet the build up of vapours in confined environments may cause asphyxia (due to oxygen deficiency).
- Vapours are invisible, yet the expansion of the fluid generates fog in presence of wet air. Vapours density is higher than air and they propagate near the ground.
- A significant heating of the vessel (for instance in case of fire) causes a huge increase of the fluid volume and pressure, with danger of burst of the vessel containing it. The contact with the fluid may cause severe injuries to skin and eyes due to cold.
- Combustion produces CO₂ (carbon dioxide), asphyxiating gas; in case of oxygen deficiency, due to insufficient aeration/ventilation/fume discharge, it may produce CO (carbon monoxide), a highly toxic gas.

(3) COMPOSITION/INFORMATION ABOUT THE COMPONENTS

3.1 Substances:

Derived from oil distillation and processing, from extraction well by separation of natural gas, from chemical processes.

The LPG is essentially a mix of propane and butane. The commercial composition may contain small amounts of other saturated hydrocarbons (ethane, isobutene and pentane) or unsaturated hydrocarbons (propylene and butenes) whose dangers do not differ from those typical of the substance indicated in section 2.

It does not contain amounts of 1,3 butadiene over 0.1%.

If marketed for combustion it contains a **denaturant** product (4 g for each 100 kg of LPG, as established by M.D. 21.3.1996 of the Ministry of Finance).

The LPG may as well contain an **odorizing** product, in order to enable its detection with concentrations lower than the L.I.E., in compliance with Law 6 December 1971, no. 1083.

Gas odorization must be realized according to standards UNI 7133 (combustible gases) and UNI EN 589 (LPG for vehicles).

The concentrations of the above products, however, are lower than the prescribed limits.

3.2 Mixtures:

Not applicable

(4) FIRST AID INSTRUCTIONS**4.1 Descriptions of first aid action:**

In case of:

Inhalation (gas phase):

- remove the injured person from the polluted area;
- immediately treat the injured person in case of symptoms due to vapours inhalation;
- ventilate the injured person in case of respiration difficulties.

Contact with skin (fluid phase):

- wash the affected part of the skin with water; remove clothing carefully and wash the affected part with plenty of water.
- seek a doctor for the treatment of possible lesions caused by cold.

Contact with eyes (fluid phase):

- wash with plenty of water with eyelids fully open; seek a specialist as soon as possible.

Ingestion:

- not applicable.

(5) FIRE-FIGHTING MEASURES**5.1. Extinguishing fires**

LPG minor fires can be extinguished with fire extinguishers suitable for Class C fireworks, such as type of dry chemical or carbon dioxide type.

Are not adequate to the fires of LPG water or foam extinguishers.

The use of chemical powder fire extinguishers and carbon dioxide is also suitable for extinguishing fires involving the means of transport.

5.2. Special hazards related substance

The combustion of the substance produces carbon dioxide (CO₂), asphyxiating gas. In the absence of oxygen, there is insufficient ventilation / ventilation can produce toxic fumes of carbon monoxide (CO).

5.3 Advice for fire-fighters:

Do not extinguish a fire if you're not sure to be able to intercept the gas flow.

An immediate outflow is preferable to a gas cloud, which expands and may find a source of ignition.

Use water to cool canisters and tanks hit by the fire to avoid overheating (with possibility of burst).

Small fires can be extinguished with chemical dust extinguishers, or with carbon dioxide extinguishers.

Significant amounts of burning outflows, when it is not possible to extinguish them by stopping the gas flow, shall be minimized and kept under control using spread jet water nozzles.

Use nebulised or split jet water to dilute, below the explosion threshold, the concentration of gas

clouds (if any).

Dangerous products of combustion: CO₂, with danger of asphyxia in confined areas.

The special equipment for fire-fighting squads shall include helmets, visors, gloves as well as, in the most difficult cases, fire repellent suits and autorespirators.

(6) MEASURES IN CASE OF ACCIDENTAL OUTFLOW

6.1. Personal precautions, protective equipment and procedures in case of emergencies.

- Do not use electric devices, unless in safety conditions (for ex. Explosion-proof);
- Stop the outflow source, if it is possible to do it without risk;
- Avoid liquid contact with skin and eyes.

6.2. Personal precautions, no-directly operation:

In case of spills or accidental releases of substances, it's recommended:

- Wear antistatic clothing made of cotton or wool and antistatic footwear. Avoid synthetic fabrics;
- Remove ignition sources.
- Prevent the gas from flowing into underground areas (e.g.: cellars, etc.), taking into account that vapours are heavier than air.
- Isolate the outflow area
- Inform the competent authorities according to the emergency plans
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6.3. Personal precautions, directly operation:

- Wear antistatic clothing made of cotton or wool and antistatic footwear. Avoid synthetic fabrics;
- Protect eyes with glasses or face shield
- Wear antistatic footwear
- Protect your hands with gloves

(7) HANDLING AND STORAGE

7.1 Handling

- Avoid dispersions into the atmosphere
- Handle the product with closed circuit systems;
- Operate in well ventilated areas;
- Do not operate near ignition sources;
- Use anti-spark devices.
- Properly ground the equipment and avoid the build up of electrostatic charges during transfer and bottling operations;

To follow hygienic purposes we recommend:

- Don't eat, drink and smoke in working areas;
- Wash hands after use;
- Remove contaminated clothing and protective equipment before entering areas where you eat.

7.2 Storage

- Deposits, bottling and transfer plants must be designed, realized and managed according

to the specific technical safety rules for fire avoidance issued by the Ministry of Interior and the technical standards issued by CIG and published by UNI.

- In the areas classified according to the ATEX Directive, use safety electric equipment only, with Ex execution, group II G, temperature class not lower than T2.
- Fixed tanks, being pressurized equipment, must comply with the requirements of directive 97/23/CE (PED) and undergo periodical checks;
- Mobile vessels (canisters, drums, tank trucks, etc.) must comply with the requirements of the directive 1999/36/EC (TPED) and of ADR standards
- Do not store with oxidizing gases.

7.3 Specific uses

Storage and handling of the product to be used for lighters, lighter recharges, aerosol and gas cartridges with their vessels must comply with ADR standards, specifically the packing instructions P003 (P002 for lighter refill art. 10051 – ONU code 1057)

(8) EXPOSURE SAFETIES / PERSONAL PROTECTION

8.1 Exposition limit thresholds

Dangerous concentrations for professional inhalation, above which damage due to exposition is foreseeable, are included in the document by ACGIH "Threshold Limit Value (TLV's) for Chemical Substances and Physical Agents & Biological Exposure Indices (BEI's), 2006 edition.

TLV-TWA : 1000 ppm *

Average concentration weighted over time (standard working day of 8 hours, 40 weekly working hours), to which the workers can be repeatedly exposed, day after day, without negative effects.

* - The specific TLVs for the LPG were removed in 2004. The table value, in compliance with the 2006 update, refers to "**Aliphatic hydrocarbons: Alkanes [C1-C4]**".

8.2 Exposure safeties

(a) Respiratory protection

In case of interventions in areas with gas presence, use autorespirators;

(b) Skin protection

Use complete antistatic clothes, covering both upper and lower limbs

Hands protection

Use leather gloves and thermal insulation gloves with forearm protection for emergency.

(c) Eyes protection:

Use safety goggles, visors, face shields to protect from fluid jets.

(d) Thermal protection:

Against the dangers of frostbite for jet of liquid, use goggles or face shield, gloves and clothing to cover full insulation of the trunk and limbs

8.2.2 Environmental exposure protections

No evidence.

(9) PHYSICAL AND CHEMICAL PROPERTIES

9.1, 9.2, 9.3

Stabilized physical state:	pressurized liquefied gas
Colour:	colourless
Smell:	characteristic, if odorized for combustion or vehicles use (1)
Smelling point:	0.2 ÷ 0.4% with odorizer
PH:	neutral
Solvents:	methanol, ethanol, ether
* Volumic mass of the fluid at 15° C, in Kg/l:	0.508 (propane) to 0.584 (butane), (method ASTM D 1657)
Density (relative to air – gas phase)	From 1,5 (propane-propylene) to 2,0 (butane)
* Volumic mass of steam at 15° C, in Kg/m ³	1.76 (propylene) to 1.86 (propane) to 2.45 (butane)
* Steam tension (abs.) at 15°C, in bars:	10.2 (propylene at 20°C) to 7.5 (propane) to 1.8 (butane), (method ASTM D 1267)
* Boling point in °C:	-48 (propylene) to -42 (propane) to -0.5 (butane)
* Melting point in °C:	-187 (propane) to -185 (propylene) to -138 (butane)
* Flash point in °C:	-107 (propylene) -104 (propane) to -60 (butane)
* Self ignition point in °C:	From 468 (propane) to 455 (propylene) to 405 (butane)
* Critical point in °C:	From 92 (propylene) to 96.5 (propane) to 151 (butane)
Lower and higher flash point threshold in air, % in volume	Lower 1,8 ÷ 2,27 Upper 8,41 ÷ 11
Materials suitability:	It melts fat and attacks natural rubber. Not corrosive for metallic materials.
Solubility in water:	marginal
** Dynamic viscosity in fluid phase, in Pa x s	11x10 ⁻⁵ (propane) to 17x10 ⁻⁵ (butane)
** Thermal conductivity in fluid phase at 15°C in W/m x °C:	13 x 10 ⁻² to 22 x 10 ⁻²
***Electric conductivity in fluid phase (at 0° ÷ 20°C) in Ω ⁻¹ x m ⁻¹	0.1 ÷ 0.5 x 10 ⁻¹² (propane), 1 ÷ 5 x 10 ⁻¹² (butane)

Notes: * Intermediate mixes feature values proportional to their percentages.

** Technical Data Book – A.P.I. (2nd edition, 1970)

*** Encyclopédie des gaz – ELSEVIER (1976)

(1) When not fragrant enough, the GPL will be stenchd to be detected before reaching dangerous concentrations in case of disturbances in the air. (6.12.1971Law, No. 1083, and UNI 7133).

(10) STABILITY AND REACTIVITY**10.1 Reactivity**

May form explosive mixture with air

10.2 Chemistry stability

No instability condition.

10.3 Dangerous reactions

No condition giving rise to dangerous reactions

10.4 Conditions to be avoided

Avoid significant heating of product and vessels.

Avoid quick decompression of the vessels since it generates significant cooling, with temperatures well below 0 °C.

10.5 Materials to be avoided

Incompatible with oxidizing agents.

10.6 Dangerous decomposition products

In case of trigger, it burns with exothermal reaction and production of carbon monoxides (CO₂, CO)

No possibility of degradation with formation of unstable products.

No stabilizer is required.

(11) TOXICOLOGICAL INFORMATION**11.1 Information about toxicological effects:**

Acute toxicity: slightly narcotic product; in high concentrations can cause asphyxia.

The quick evaporation of the product in fluid phase in contact with eyes and skin causes burns due to cold.

There are no evidences related to the following effects:

- chronic toxicity
- sensitizing power
- carcinogenesis
- mutagenesis
- teratogenesis

(12) ECOLOGICAL INFORMATION**12.1 Toxicity****12.2 Persistence and degradability****12.3 Potential of bioaccumulation****12.4 Soil mobility**

There are no data of ecotoxicity and biodegradability due to the high volatility of the product: it doesn't persist in aqueous means therefore it is not possible to perform the tests.

The release of big quantities of the product in the environment can increase the air content in

volatile organic compounds (V.O.C.).

Therefore it is necessary to avoid outflows by carrying out the handling in a closed cycle.

The product is classified in danger class “0 – generally non polluting waters” – (sources BASF and HUELS – IUCLID, Existing Chemicals – 1996)

Ozone depletion potential (O.D.P.): 0 zero

Immiscible in water.

(13) CONSIDERATIONS CONCERNING DISPOSAL
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Take all the measures necessary to avoid product dispersion into the atmosphere.

Do not dispose of the product in sewers and in the environment.

In case of product disposal due to emergency, we recommend burning supervised by qualified technician.

There is no problem related to the disposal of vessels for use, transport and storage, because the vessels (canisters, drums, etc.) usually can be recharged.

The vessels which can no longer be used must be decommissioned according to standard UNI EN 12816 and disposed of according to Law Decree 152/2006 and s.m.e.i.

(14) TRANSPORT INFORMATION

14.1 ONU Number

2037 cartridges with valves – non refillable

14.2 Shipping ONU name:

2037 cartridges with valves; receptacles, small, containing gas without release device, not refillable

14.3 Hazard class (shipping related)

Class: 2
Classification code: 5F
Danger Label: 2.1

14.4 Packaging group

Not applicable

14.5 Environmental hazard

Transport by sea - I.M.D.G.	Subsection 2.1	UN 2037 (cartridges with valves) Marine pollutant: EMS-Nr.: F-D,S-U for pierceable cartridges MFAG: table no. 620
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Air transport I.C.A.O. / I.A.T.A.	Subsection 2.1	UN 2037 (cartridges with valves) Air Cargo: Yes Airliner: No
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14.6 Special precautions for users:

Before starting transport of gas cylinders:

Ensure that containers are firmly secured;

Ensure that the valve is close tight;

Make sure the cap is properly applied to the output of the tap.



Transport label: 2.1

flame and number symbol can be black or white alternatively on red background

(15) INFORMATION ABOUT STANDARDS AND RULES
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15.1 Standards and legislation on health, safety and environmental specifications for the substance:

- Law Decree 17 August 1999, No 334 "Implementation of Directive 96/82/EC on the control of major accident hazards involving dangerous substances"
- Law Decree 21, 2005, No 238 "Implementation of Directive 2003/105/EC that modify Directive 96/82/EC on the control of major accident hazards involving dangerous substances"
- Decree of August 9, 2000 "Guidelines for the implementation of of safety system management" (Environment Ministry).
- Ministerial Decree 26 May 2009, No 138 "Regulations on the rules of the forms of consultation for staff working at the plant on the internal emergency plans, according to art. 11, paragraph 5, of Legislative Decree 17 August 1999, Ranked # 334. "(TAF Min)
- Decree 24 July 2009, No 139 "Regulations on the rules of the form of consulting the public about emergency plans, according to art. 20, paragraph 6, of Legislative Decree 17 August 1999, Ranked # 334. "(TAF Min)
- Ministerial Decree October 13, 1994 ""Fire avoidance technical rule for design, building, installation and operation of LPG deposits in fixed vessels with overall capacity over 5 m³ and/or in mobile vessels with overall capacity over 5,000 kg".
- Decree 14 May 2004 ""Approval of the fire avoidance technical rule for installation and operation of LPG deposits with overall capacity not over 13 m³." (Internal Min)
- Circular of September 20, 1956, No 74 of the Ministry of the Interior, for the following parts:
 - Part Two "Safety for the construction and operation of deposits of LPG in cylinders, up to 5,000 kg"
 - Third Party "Safety standards for the resale of LPG, up to 70 kg"
 - Part Four "Safety standards for the centralized systems of distribution of LPG cylinders for domestic use, up to 2,000 kg"
- Legislative Decree 2 February 2002, No 23 " Implementation of the directives 1999/36/EC, 2001/2/EC and of deliberation 2001/107/EC concerning transportable pressure equipment"

15.2 Chemical safety assessment:

There are no evidence in this regard

(16) OTHER INFORMATION

Risk indications:

Workers must be informed and trained based on their specific jobs, according to applicable laws.

Here is a list of the major laws and technical rules containing the applicable dispositions.

D.M. 13 October 1994 Ministry of Interior	“Training of the persons in charge of LPG deposits.”
D.M. 15 May 1996 Ministry of the Environment	“Safety procedures for transfer of LPG into deposits”
D.M. 13 March 1998 Ministry of Interior	“Obligation to train fire fighting and emergency management squads for all the activities subject to fire avoidance certificate”
D.M. 15 March 1998 Ministry of the Environment	“Methods to inform, train and equip workers <i>on site</i> ”.-
Decree 14 May 2004 Ministry of Interior	“Training of drivers in charge of filling LPG tanks with capacity up to 13 m ³ ”
ADR 2011 / Part 1 Ministry of Transport	1.3 Training of workers involved into dangerous shipping 1.4 Safety obligations of the operators 1.10 Rules concerning safety

Legen – abbreviations and acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists (USA);
ADR	International Agreement dangerous transport by road
CLP	Classification – Labeling and packaging
DM	Ministerial Decree
D.Lgs	Legislative Decree
RID	International Agreement for dangerous shipment by rail
TLV-TWA	weighted average concentration in 8 hours-working-day for 40 hours in week.

Source of the data used:

Handbook butane-propane gases - Denny, Luxon and Hall (4th ed. 1962)
Engineering Data Book – Gas Processors Suppliers Association (fifth revision, 1981)
Technical Data Book – A.P.I. (2nd edition, 1970)
Encyclopédie des gaz – ELSEVIER (1976)
ECB - ESIS - European Chemicals Substances Information System
ACGIH “Threshold Limit Value (TLV’s) for Chemical Substances and Physical Agents & Biological Exposure Indices (BEI’s), edition 2006.

The current Sheet is drafted in compliance with Annex II of Regulation (EC) no. 1907/2006.

The information contained in this sheet refer to the identified product only and may not be applicable if the product is used in conjunction with others or for uses different from those foreseen.

The information herein is based on the knowledge in our possession as of “4 September

2011”.

Downstream users and distributors concerned by this Sheet must draft their safety data according to applicable scenarios and information.