

LPG has many advantageous qualities benefiting both end users and society as a whole. In addition to being **highly efficient, cost effective, clean burning** and **controllable**, LPG has significant environmental advantages - it is a **low carbon alternative** being free of both lead and sulphur. Such qualities provide peace of mind in today's society where environmental concerns are increasingly at the forefront of consumers' minds and governmental policy making.

The principle characteristics of LPG are outlined here, but for further information please visit **www.flogasni.com**.

- Obtained during the processing of crude oil or direct from the North Sea.
- LP Gas can consist of Propane or Butane or mixtures thereof. Colourless and odourless, an odourising agent is added before distribution to give its characteristic smell.
- Half as heavy as water in liquid form. It will float on water before vaporising.
- Easily liquefied by pressure, taking up approximately only 1/250th of its gaseous volume. This means that a large amount of LPG can be stored in a small space.
- Either commercial PROPANE or commercial BUTANE. These are similar in use, but propane has a lower boiling point, and hence a higher storage pressure. Commercial propane is predominantly an outdoor fuel, commercial butane is predominantly an indoor fuel.
- At normal temperature (i.e. 15°C), propane and butane bottles are found at the following pressures:

Commercial BUTANE
Commercial PROPANE

2 BAR (28 psig)
7 BAR (100 psig)

Propane (C ₃ H ₈) Butane (C ₄ H ₁₀)	Commercial Propane	Commercial Butane
Relative density of liquid at 15.6°C (60°F)	0.50 to 0.51	0.57 to 0.58
Imperial gallons/ton at 60°F	439 to 448	385 to 393
Litres per tonne at 15.6°C (60°F)	1,965 to 2,019	1,723 to 1,760
Relative density of gas compared with air at 15.6°C (60°F) and 30 in Hg (1015.9 mbar) pressure	1.40 to 1.55	1.90 to 2.10
Volume of gas (ft ³) at 60°F and 30 in Hg pressure per lb of liquid	8.6 to 8.7	6.5 to 6.9
Volume of gas (m ³) at 15.6°C and 1015.9 mbar pressure per kg of liquid	0.537 to 0.543	0.406 to 0.431
Ratio of gas volume at 15.6°C (60°F) and 30 in Hg (1015.9 mbar) to liquid volume	274	233
Boiling point at atmospheric pressure °F approx °C approx	-49 -45	28 -2
Latent heat of vaporisation at 60°F (Btu/lb)	154	160
Latent heat of vaporisation at 15.6°C (kJ/kg)	358.2	372.2
Specific heat of liquid at 60°F (Btu/lb deg F)	0.60	0.57
Specific heat of liquid at 15.6°C (Btu/lb deg C)	2.512	2.386
Sulphur content, per cent, weight	Negligible	Negligible
Calorific value (approximate):		
Gross		
Btu/ft ³ dry	2,500	3,270
MJ/m ³ dry	93.1	121.8
Btu/lb	21,500	21,200
MJ/kg	50.0	49.3
Net		
Btu/ft ³ dry	2,310	3,030
MJ/m ³ dry	86.1	112.9
Btu/lb	19,900	19,700
MJ/kg	46.3	45.8
Therms / ton (gross)	482	475
GJ/tonne (gross)	50.0	49.3
Air required for combustion		
Volume to burn unit volume of gas	24	30

(Note: 1 tonne = 1,000 kg = 2204 lb.)

CONVERSION FACTORS

Energy

1 kW	=	3412 Btu/hr	=	3600 kJ/hr
1 Btu / hr	=	0.000293 kW/hr	=	1.055 kJ/hr
1 Therm	=	100,000 Btu	=	105.5 MJ

Pressure

1 bar	=	1000 mbar	=	14.5 psi
1 mbar	=	0.401 ins w.g.		
1 in w.g.	=	2.491		
1 psi	=	27.68 ins w.g.	=	68.95 mbar

Volume

1 Gal (UK)	=	4.546 Litres	=	1.2 Gal (US)
1 gal (US)	=	3.785 Litres	=	0.833 Gal (UK)
1 Litre	=	1.76 pints	=	0.22 gal (UK)
1 cubic metre	=	35.31 ft ³		
1 cubic foot	=	0.02832 m ³		

L.P.G. (Liquefied Petroleum Gas)

		Propane	Butane
1 Gallon	=	112,000 Btu 32,825 kW	124,000 Btu 36,342 kW
1 Litre	=	24,637 Btu 7.221 kW 10 ft ³ gas (vapour) 0.28 m ³ gas	27,277 Btu 7.994 kW 8 ft ³ gas (vapour) 0.24 m ³ gas