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SERVICE INFORMATION

LPG CYLINDER VAPORISATION

From	Our Reference	Tel.	Date
TT/SAU-ASA2	LP Vapourisation	1300 307 037	June 2021

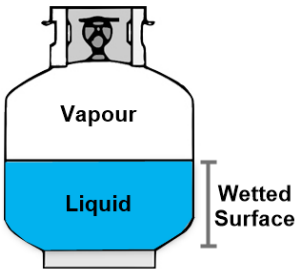
Reason For Information:

The sizing of an LPG cylinder is important to ensure that the cylinder can provide enough gas for the correct operation of the gas appliances it is supplying.
The vaporisation capacity, or amount of available gas (MJ/hr) a cylinder can provide is dependent on several factors, the 'wetted surface' of the cylinder which incorporates the size and how full the cylinder is, and the ambient air temperature around the gas cylinder.

Vaporisation:

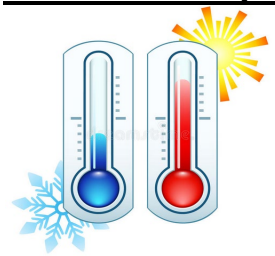
LPG is stored in the cylinder under pressure in a liquid state. The liquid boils and turns back into a vapour state when pressure is released from the cylinder, such as turning on a gas appliance. To boil, the liquid draws heat through the walls of the gas cylinder, which in turn gets its heat from the external ambient air temperature around the cylinder. The faster the rate the liquid boils the larger the vaporisation capacity, resulting in more available gas.

Wetted Surface:



The surface area inside the cylinder which is bathed in liquid is called the 'wetted surface'. This is the area where the liquid draws heat through the cylinder walls for vaporisation.
The larger the wetted surface area the more heat is drawn for vaporisation leading to a more rapid boil of the liquid, resulting in a higher amount of available gas (MJ/hr) for consumption.
ie. The larger the bottle, the larger the wetted surface. As the bottle empties, the smaller the wetted surface becomes.

Ambient Temperature:



The external temperature of the ambient air around the cylinder also affects the vaporisation capacity. The higher the ambient temperature the more heat is drawn through the walls of the cylinder to the liquid resulting in a faster boil and greater production of vapour. Conversely lower temperatures reduce the heat available to the liquid resulting in a slower boil and reduction of vaporisation capacity.

What Size Bottle Is Required?

It is critical for correct operation of an LPG gas appliance that the gas cylinder supply is sized correctly for the application. The cylinder may provide enough gas for operation when full, but as the cylinder empties the appliance may then starve for gas. The following chart provides information on the amount of available gas (MJ/hr) in relation to the above variables.

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Vaporisation chart:

Bottle Size/Supply	% Fill of Cylinder	Temperature °C							
		-4	1	4	8	12	16	20	24
 9kg	20	27	32	36	39	43	47	53	59
	50	41	48	53	59	65	71	80	89
	83	54	64	71	78	86	94	106	118
 45kg	20	94	110	123	135	150	163	184	204
	50	141	166	184	202	224	245	276	306
	83	187	220	244	268	298	325	366	407
 2 X 45kg Manifold*	20	188	221	245	270	299	327	368	409
	50	282	331	368	405	449	490	552	613
	83	374	439	488	537	595	651	732	813

***Manifold being that both cylinders are supplying gas at the same time.**

MJ/hr

83% is the maximum fill of an LPG cylinder

Megajoule rating (MJ/hr) of Bosch appliances

Hot Water Appliances	MJ/hr
Optiflow 16L	122
Optiflow 20L	149
Optiflow 26L	199
4000S 12L Internal/External	90
4000S 16L Internal	120
4000S 20L Internal	149
10P Pilot	82
16P Pilot	130
10H HydroPower	79
13H HydroPower	104
16H HydroPower	130
Ci10 Internal	79
Ci13 Internal	100
Ci16 Internal	127

Heating Appliances	MJ/hr
Condens 5000W 18kW	75
Condens 5000W 30kW	130
Condens 5000W 37kW	160
GAZ 6000W	132.8

If the amount of available gas (MJ/hr) shown in the table above is below the MJ/hr rating of the appliance, then that size cylinder is not suitable.

It should be taken into account that if there are more than one appliance being used, the MJ/hr rating of all appliances need to be added together.

Other factors to consider which may lower the MJ/hr from a gas cylinder is undersized pipe work, or the use of flexible hoses, and wrong type of regulator used, a regulator that is normally suited for a BBQ will not be sufficient for Hot Water or Heating appliances.

Follow these links for further information:

https://www.elgas.com.au/blog/1948-how-lpg-propane-liquid-changes-to-gas-lpg-vaporisation

https://www.elgas.com.au/blog/2241-can-you-use-a-9kg-gas-bottle-instead-of-a-45kg