There’s no quick way to simplify this… gas, gas hoses, gas regulators and the plethora of gas fittings can make setting up your camping stove & appliances an utterly confusing affair! We’ll try and make things as clear as we can in this article. Let’s first start with the gas, or as we commonly call it in Australia, LPG.

What is LPG?

LPG stands for Liquefied Petroleum Gas.
At a basic level, LPG is a flammable hydrocarbon fuel. It consists of a mixture of carbon and hydrogen atoms which, when placed under pressure at room temperature turns into liquid. The gas we use for camp stoves, many home appliances, gas hot water systems and in vehicles is LPG, but the actual gas in LPG depends on the country you are in and its designated use. There are two gases that come under the LPG heading – propane and butane.
In Australia, the LPG that is used to top up your refillable bottle at your local hardware or camping store, or the gas in the 9kg cylinder swaps is always propane. Whereas in New Zealand, for example, this LPG could be propane, butane or a mix of these.
The LPG used for vehicles in Australia is known as AutoGas and can be propane or a mix of propane and butane.

LPG gas is made up of petroleum gases. Image: Elliot Mann

What is the difference between Propane and Butane?

This is all in the chemical makeup – Propane being C3H8 and Butane C4H10. Their formulas differ but they contain the same base elements of carbon and hydrogen.
The pressure at which these gasses become a liquid, or, their boiling point for a given temperature, is a key difference.
Propane remains a liquid either when under pressure or at temperatures less than -42°C, which means it still turns into a burnable gas when released from pressure in very cold environments. At room temperature (approximately 21°C) the pressure of propane gas is about 860kPa, which is why cylinders being filled with propane need to be made strong, hence their weight.
Butane is also a liquid when under pressure or at temperatures less than about -0.5°C which is much higher than propane and why many lightweight hiking stoves that run on butane struggle in alpine environments. However butane gas, or n-butane to be precise, has a pressure at room temperature (approximately 21°C) of about 215kPa which means the cylinders can be made much lighter, hence why butane is typically preferred for hiking stoves.
You may have also heard of iso-butane, this is similar but has slightly different properties than the n-butane mentioned here.
Despite butane and propane being closely related in terms of their chemical makeup, the combustion characteristics i.e. how they burn is quite different. The good news is that most (not all) LPG appliances are certified to what is known as ‘Universal LPG” meaning they can be used with propane, butane or any mix of these.

LPG is liquid under pressure and becomes gas when released into the atmosphere.

Is LPG the same as natural gas?

No. Natural gas is methane and has a different chemical makeup (CH4) which can't be used interchangeably with LPG in the same appliance unless the appliance has been converted to do so.
Natural gas appliances operate at much lower pressures than LPG (1.1kPa vs 2.75kPa), more natural gas is needed to produce the same amount of heat as LPG and it requires a different oxygen-to-fuel ratio for complete combustion.
Natural gas is also cryogenically turned into a liquid to become Liquid Natural Gas (LNG) primarily for transport reasons, in particular for bulk transport overseas.

What gas can my LPG appliance use?

LPG appliances are required by law to be clearly labelled for which type of gas they are designed to use.
The gas types are: Propane only, Butane only, Universal LPG (which is either Propane, Butane or a mix of these) and Natural Gas.
So, check the information on your appliance to identify the gas type it is designed for as it can be dangerous or even fatal to use the wrong gas.

You can't use natural gas interchangeably with LPG appliances. Image: Oil & Gas Australia

What gas bottles can you use for your camping stove?

This is dependent on the gas appliance.
Most lightweight hiking stoves and lanterns are only designed to be used with disposable cylinders that have a resealable valve and thread, allowing the cylinder to be removed for transport.
Compact canister or cartridge appliances and 'lunchbox' style stoves should only be used with butane canisters (the ones that look like a regular aerosol can). These also have a resealing valve with a bayonet 'click' type fitting.
Then there is the larger LPG cylinders which come in many sizes from about 1.25kg through to the large 9kg which a majority of other LPG appliances are designed to be used with.
Which one you choose is dependent on how you will be using your appliances, the amount of gas you'll need before a refill, and how you will transport it. While we are on the topic, it's worth noting that gas cylinders should never be transported inside a vehicle, caravan or camper trailer unless they are in a certified gas cylinder compartment.
Episode 19 of the Snowys Camping Show Podcast dives into a bunch of tips on Managing & Carrying Gas for Camping.

There are a few different sizes of gas bottles available.

One last thing that's worth mentioning, and this gets a little technical, is something called the

maximum evaporation rate. As gas changes from liquid to gas, it uses energy which it gets in the form of heat from the cylinder itself, the LPG inside and the surrounding air. This is why a gas cylinder feels cool to touch after use.
What this means is that if you use a small 1.25kg cylinder on a large 5 burner BBQ, the cylinder will quickly cool down to a point that the LPG is no longer boiling inside and turning into gas. The gas pressure then diminishes to a point that affects the performance of the appliance.

How do you make sure you're using the right gas cylinder connectors and fittings?

Firstly, let's cover the most common gas fittings you'll find on a gas bottle.
Many 1kg through to 4kg cylinders have a male 3/8″ Left-Handed thread that points directly up from the top of the bottle. This fitting is often called 'Companion' but is used by many brands.
The POL fitting (derived from the manufacturing company, Prest-O-Lite), is found on larger 4kg to 9kg cylinders. This is a female fitting and points out sideways from the bottle. Many male POL fittings have a rubber o-ring and should not be over tightened.

Larger bottles generally have POL while the smaller ones have 3/8 BSP fittings.

Lastly but less commonly nowadays is the Primus gas cylinder thread. This is a proprietary fitting by Primus that has an internal fitting that only allows gas to flow once the fitting is fully inserted into the cylinder.
An interesting thing to note is that the 3/8 and POL fittings are a left-hand thread. So, the *lefty loosey – righty tighty* rule needs to be reversed here.
Most larger format stoves and barbecues will have a male POL fitting on the supplied hose whereas a 2-3 burner camping stove will generally have a female 3/8" fitting.
Ideally, you should use a gas cylinder with the same connection as your appliance.
Then, just to keep you on your toes, in April 2021 a new gas connection called LCC27 was introduced to replace the current POL fitting. The transition will happen over a few years with the old POL fitting slowly being phased out. This connection improves safety but instead of overloading you with the info now, we'll decode everything for you and break it all down in another article soon.

Hoses will either come with a POL (L), BSP 3/8″ LH thread (R) or Primus connection.

Can you use adapters for your gas cylinder?

First up I just want to mention that introducing adapters into your gas setup makes for more gas connections, increasing the risk of a gas leak, so make sure you check for leaks.
That being said, and now that you're aware of the safety risks, with the use of a '3/8"BSP–POL' or 'POL-3/8"BSP' adapter, you can use either bottle with either appliance.
There are even 'double adapters' so you can run two gas appliances from one cylinder.

You can use a compatible adapter to use your appliance with a different bottle.

Can you use a longer gas hose with your camping stove?

Yes and no, there are regulations and laws around this all in the name of safety. In brief, you cannot lengthen the hose of a high-pressure stove but you can lengthen the hose of a low-pressure stove. In either case, you cannot join two gas hoses together.
A low-pressure appliance will have a 2.8kPa regulator at the gas bottle end of the hose which lowers the pressure of the gas in the hose. Longer approved hoses are available up to 3 metres to increase the distance of the low-pressure portion of a gas hose. This is common in a caravan setup where longer hoses are used to attach a low-pressure stove to the regulated low-pressure gas supply in a caravan. The problem here is that there are very few true low-pressure stoves on the market.
A high-pressure stove has an unregulated high-pressure gas supply from the gas bottle to the appliance. Some appliances have a regulator at the stove end of the hose, but the gas in the hose is still high-pressure. You cannot use a longer hose on these stoves as dangerous flare-ups can occur.
We recommend that wherever possible, use the hose that was supplied with your stove or appliance.

Most gas appliances will have a flying disc regulator.

Do you need the regulator on the hose?

The simple answer is that if the gas appliance in question came with a regulator, then yes, you need the regulator.
An appliance that came with a regulator assembly on the hose is referred to as a low-pressure appliance, whereas an appliance that simply has a hose directly from bottle-to-appliance is referred to as a high-pressure appliance.
Most gas appliances, except for some 2-3 burner gas stoves, have the flying disc-shaped regulators pre-set to 2.8kPa which is the pressure at which the appliance is designed to operate.
If the appliance you purchased came with a regulator assembly then you need to make sure you use the regulator in the system, and if/when replacing the hose and/or regulator, ensure you replace like-for-like.
If in doubt, check the information plate on the appliance where by law the safe operating gas pressure must be stated.

Here’s an example of what a regulator looks like on a Coleman stove.

Connecting a low-pressure stove or appliance to a caravan or camper trailer

This is one instance whereby you need to remove the hose and regulator that came with your stove in order to connect it directly to an already regulated gas supply.

The LPG gas supply that is permanently plumbed into a caravan or camper trailer is generally regulated to 2.8kPa at the gas bottle, meaning every gas outlet in the caravan is 2.8kPa. You cannot connect a high-pressure stove to this system.
In order to connect a low-pressure appliance, you need to remove the regulator and connect directly to a 2.8kPa outlet. This is usually a bayonet fitting with an alternative hose that does not have a regulator. There are only a handful of stoves suitable for this – the Wok Burner and the RV Stove & Grill both in our range and from Companion, will work!
Be aware that gas systems in caravans and camper trailers are covered by standards and must only be installed or modified by licensed gas fitters.

Here's what a permanently plumbed gas supply on a caravan will look like. Image: Barry Childs

What about the gas fittings on the side of gas appliances?

These fittings can vary considerably, most 2-3 burner gas stoves will have either a coarse or fine thread fitting. Many have less common sizes to ensure you use the right regulators and hoses, for example, cast iron burners tend to have smaller ¼" BSP fittings.
It would be nice if we could simplify all these fittings to have just one or two universal types. But instead, there's a whole bunch of variants you may come across, and if you're looking for clarity on something we haven't already mentioned, hopefully, the extra four listed below will help you out.

Cast iron burners generally have a 1/4 BSP fitting. Image: Hampdon Industrial

BSP

British Standard Pipe is a common type of thread used in Australia for gas and water connections. The acronym refers specifically to the thread type and is available in numerous sizes.

SAE

Society of Automotive Engineers is another thread type available in numerous sizes. These fittings are identified by the 45-degree tapered end on the male fittings and are less common on general camping stoves.

An SAE fitting has a 45-degree tapered end. Image: Caravans Plus

UNEF

United National Extra Fine (screw threads) is another thread type used for gas connections and is a bit like SAE.

BOM/Coleman/CGA600

This fitting is specifically for and found on appliances that utilise disposable propane canisters. We had to ask around, but we believe that the BOM acronym comes from the name ‘BernzOmatic” which is a USA based company that uses the CGA600 connection for their cylinders.
LPG gas bottles can be used with these appliances via BOM to POL and BOM to 3/8″ LH adapters allowing connection directly from the LPG bottle to the regulator for the appliance.

BOM fittings are for appliances that use disposable propane canisters.

One last note on cylinder safety

For the safety of you and those camping with and around you, read our Ultimate Gas Cylinder Safety Guide. The safe use and maintenance of your gas equipment is your responsibility, and a gas explosion is likely to ruin more than just your bacon and eggs.
If you have any doubts then get in touch so we can try and help, and for safety’s sake, don’t take shortcuts or try and bodge something up, it’s just not worth it.
A very big thank you to Ben Greeneklee who, with over 20 years of experience in gas appliance manufacturing and testing, helped us with the technical accuracy of the information in this article.
Got any questions or details you’d like to see added to this article? Let us know in the comments below and in the meantime, we’ll get busy on the details surrounding the new LCC27 connection that’s replacing the POL fitting.