

How To Choose A Backpacking Stove



A reliable stove system is essential to your backpacking setup.

After all, it's only fitting to eat a hot meal while you relax and soak up those well-earned million-dollar views. But with the dozens of stove models available today, it can be difficult to narrow down the options and choose the stove that is best suited to your needs.

Of all the available backpacking stoves on the market today, most fall into two basic categories: canister stoves and liquid gas stoves. The exceptions are several hybrid models that can run on either canister or liquid gas, and alternative stove systems (such as a wood-burning, alcohol, or solid fuel stoves) that fit in neither category. The type of stove that will best suit your needs is largely dependent on the type of backpacking you plan on doing.

As a general rule, canister stove systems are the go-to choice for summertime excursions, trips that require you to keep your pack weight as low as possible, and campers who want an easy-to-use system. Liquid gas systems are preferable for harsh winter conditions (such as a multi-day ski tours), cooking for larger groups of people, high-altitude expeditions, and international backpacking trips. These are just general rules, though. Each stove system has its own set of benefits, drawbacks, and considerations.

CANISTER STOVES

Canister stoves are generally characterized by a small stove that doubles as a pot stand and a pressurized fuel canister that attaches directly to the stove via a screw-threaded valve. This set-up is incredibly simple, easy to operate, and lightweight (some systems weigh as little as 7 ounces including fuel). You simply attach the canister to the stove, turn on the gas, ignite the burner, and you're only minutes away from a steaming-hot backcountry feast.



The gas contained in the canister is a blend of propane and either butane or iso-butane. There are two major reasons for using a blended gas. Butane is more stable than propane at ambient temperatures, which allows the gas to be safely stored in a lightweight canister, as opposed to the heavy-duty steel tanks required to safely store pure propane.

Secondly, butane ceases to vaporize at below-freezing temperatures while propane will. The small percentage of propane (usually around 20%) is intended to allow canister stoves to continue to perform in cold weather. In order to ensure that the stove burns both the butane and propane, it's important to stuff the canister in your jacket or sleeping bag to keep it fairly warm. If the canister is too cold, the stove will quickly burn off the propane, leaving you with a half-full canister of useless butane and a cold meal. This lack of reliability in cold weather is largely the reason liquid gas systems are preferable for harsh winter conditions.

Almost all manufacturers use the same industry-standard Lindal valve on their stoves and canisters. In theory, this should mean that any brand of screw-threaded canister should pair with any brand of screw-threaded stove. Despite this, manufacturers recommend using only their canisters with their stoves, largely because they have no control over the quality of their competitors' products. Still, it's good to know that, even if you can't purchase the matching brand of canister, you can likely find a canister that is fully compatible.

This brings up another drawback of the canister stove system, although minor, regarding the availability of fuel. While canisters can be found at most sporting

good stores, they are not available at every corner store or service station so don't bank on being able to buy one in a remote town. Generally, a four-ounce canister will cook for two people for two to three days, and keep in mind that you will need to pack out spent canisters. Just make sure to pack enough canisters for the length of your trip.



Windy conditions can greatly hinder the performance of a canister stove, and unfortunately, you can NOT use a windscreen (unless the model you're using attaches the stove to the canister remotely via a fuel line). Surrounding the stove system with a windscreen can cause the canister to heat up and potentially explode, which is extremely dangerous. You can build a wind break on one side of the stove, just make sure the downwind side of the stove is exposed and well ventilated.

Integrated stove systems (i.e. the JetBoil), which are a subset of the canister stoves, largely solve this problem. The integrated system works much the same way as a standard canister stove, except that the stove directly attaches to the cooking pot. This design greatly improves the transfer of heat from the burner to the pot, resulting in boil times as quick as two minutes and

performance that isn't hindered by the wind. A single fixed pot will limit what you can cook, but if you only require boiling water to prepare your menu, an integrated system is the by far the simplest and most efficient way to go.

As far as cost is concerned, generally, canister stoves are initially less expensive than their liquid gas counterparts. Since you can't refill a pre-pressurized canister like you can a liquid gas stove, you need to buy a new one when the canister is spent. Spent canisters must be emptied and punctured with a tool like the JetBoil Crunchit in order to be properly disposed of. The cost of refilling fuel bottles for liquid gas stoves is certainly cheaper than buying additional canisters for a canister stove, which means that in the long run, a liquid gas stove is probably more cost effective—and more environmentally friendly when you consider the waste produced by empty canisters.

LIQUID GAS STOVES

Liquid gas stoves are the proven workhorses of backcountry cooking and will perform equally well in every season of the year. The set-up is generally characterized by a fuel bottle with an integrated pump that connects remotely to a freestanding stove body via a fuel line. Unlike canister stove systems, this set-up requires some experience and a little practice to properly operate, and it requires occasional maintenance to ensure maximum performance. Although not as user-friendly or lightweight as a canister system, liquid gas stoves provide certain advantages to the backcountry traveler where other systems fall short.



Liquid gas stoves typically run on white gas, also known as camp fuel or naphtha. White gas burns exceptionally hot and generally cranks out more BTUs than a canister stove, which ultimately gives you a greater range of culinary ability in the backcountry. Before loading a fuel bottle in your pack, it's important to make sure that the cap on the bottle is closed tightly. Not only will spilled liquid fuel create a fire hazard, it will leave your pack and gear smelling like a truck stop. Also, be sure to leave an air space when you refill the fuel bottle, as gas will expand as the temperature rises, and the excess pressure could potentially create a hazard. Because the gas is in a liquid state, you have to manually pump the plunger in the fuel bottle to create the pressure that will supply the burner. While this may seem like an inconvenience, a manual pump is among the versatile benefits afforded by a liquid fuel system.

Unlike canister stoves which can be rendered useless by freezing temperatures, liquid gas systems are unaffected by winter weather, mainly because the pump allows you to create your own pressure and compensate for lower temperatures. The performance of a canister stove will also decrease as the amount of the gas in the canister drops. Once again, because you create your own pressure with a liquid fuel stove, you can maintain consistent performance throughout the entire fuel bottle.

As mentioned above, operating a liquid fuel stove requires a little more attention than a pre-pressurized canister stove. After assembling the pump, fuel bottle, and stove, you need to pump and prime the stove before cooking. To create adequate pressure, you need to pump the fuel bottle until you can

feel firm resistance (usually around 15-20 pumps). Priming is just another word for pre-heating the stove, and this step is required to convert the liquid fuel to a gas for efficient performance. The fuel line typically includes a generator loop section that runs across the burner—this is where the fuel is heated and converted into a gas. To prime the stove, open the fuel adjuster and allow about a half-tablespoon of fuel to enter the priming cup and burner, then turn the fuel off. Ignite the fuel in the cup (this can be a large flame), and when the flame begins to reduce, slowly open the fuel adjuster until you get a blue flame. Then adjust the flame to the desired amount of heat output, and begin to whip up a tasty meal.

Because the fuel bottle connects remotely to the stove, you CAN surround the stove body with a windscreen and/or heat reflector, which will significantly improve performance in gusty conditions. Keep in mind that these are very general guidelines on how to operate a liquid fuel stove. Always consult and adhere to specific manufacturer instructions regarding the model you're using. It's also a good idea to try it out first in your backyard, just to get the hang of it.



Multi-fuel stoves add even more versatility to liquid fuel systems. As the name implies, multi-fuel stoves have the ability to run on a variety of liquid fuels. Many models can burn white gas, kerosene, diesel, unleaded gasoline, aviation fuel, and the list goes on. It's because of this incredible versatility that multi-fuel stoves are the preferred choice for international trips and extremely rural areas where a canister or white gas is hard to come by. Before running your stove on a fuel other than white gas, make sure the stove is properly jetted for the fuel you plan on using. Many models require you to first install the appropriate fuel adapter and jet before using certain fuels. While multi-fuel systems provide a range of fuel options, not all fuels provide an equal level of performance.

Although kerosene is widely available, there is a noticeable odor when the stove is running and it doesn't burn quite as hot as white gas, resulting in longer cook times. Kerosene is also slow to evaporate, which creates a greater fire hazard if it's inadvertently spilled. If you have a model that will run on unleaded auto gas, you can expect performance similar to white gas. Just be aware that some gas additives (such as oxygenated gas, which is common in the US during winter months) can cause certain stove components to clog and corrode. Many liquid gas stoves include a simple maintenance kit and cleaning instructions that allow you to ensure maximum performance on every outing.

ALTERNATIVE STOVE SYSTEMS

Although not as powerful as a canister or liquid gas stove, alternative systems are quickly gaining popularity with the ultralight and minimalist backpacking crowd. Alcohol stoves are extremely light and cheap, and fuel is widely available. While you can purchase an alcohol stove, most advocates prefer to build their own out of used soda cans, and DIY tutorials are widely available on the Internet. The stoves run on denatured alcohol or Yellow Heat (a gas line anti-freeze), which is available at most gas stations and auto parts stores. Unlike white gas, alcohol will quickly evaporate if spilled in your pack and won't leave any residual odor. The drawbacks of an alcohol stove are longer cook times (7-10 minutes to boil water) and the inability to raise or lower the heat output, making it difficult to do much cooking beyond boiling water.

Wood-burning stoves can also be purchased from outdoor retailers or built with household items such as tin cans. Unlike the other stove systems

covered, you don't have to carry any fuel. As long as twigs, pine cones, bark, buffalo chips, or any other combustible materials are available along the trail, you have fuel. Again, wood-burning stoves will not provide the same performance as a canister or liquid gas system, and they are not permitted in wilderness areas that don't allow an open flame.

Solid fuel stoves burn tablets made of a flammable chemical compound that was originally developed by the military as a portable fuel source. In addition to a solid fuel tablet, the only thing required is a platform or stand that will suspend the pot above the tablet. Like the above alternative systems, you can't adjust the heat output, nor should you expect the performance of a gas stove. The tablets will also leave a residue on pots and pans. In general, an alternative stove system is a good choice if you're on a tight budget, you like to make things yourself, and you are willing to sacrifice performance for weight savings.