



Vital Stove™ – Product Comparison Matrix

Introduction

The Vital Stove™ was designed as a high efficiency, compact and portable energy source to allow people to cook food, purify water, generate energy and stay warm in off-grid situations, without harming the environment. The purpose of this *Product Comparison Matrix* is to demonstrate why the Vital Stove™ has numerous competitive advantages over well-known portable cooking stove brands when used in extreme survival situations, or during leisure trips in the wilderness. The Vital Stove™ is the only manufactured cooking device available on the market that burns any type of dry biomass fuel, and that was created specifically to meet the needs of non-governmental organizations (NGOs), governments and individuals in disaster recovery situations, as well as those of environmentally conscious outdoor enthusiasts in the wilderness.

«Le (Vital Stove™) a fait sensation auprès de nos équipes du Pérou, Équateur, Costa Rica, Italie, Espagne et Colombie. C'est grâce au poêle que j'ai pu préparer du café pour les équipes, qui eurent droit à leur premier breuvage chaud après

4 jours d'opérations ». Jean-Pierre Taschereau,
International Delegate for the Canadian Red Cross
August 2007 Earthquake in Peru

SECTION 1 – The Vital Stove™ is reliable and highly efficient in all temperatures

In this section, the Vital Stove™ is compared with best selling manufactured cooking devices that are portable and compact, can be used in outdoor adventures or emergency situations, and sold in a similar price range. Unlike the Vital Stove™ which creates 20,000 BTU/hourⁱ of intense heat from dry biomass fuels, such as wood, paper, cardboard, twigs, straw, natural fibers, animal dung and combustible waste, the devices shown in Table 1 generate a median 10,000 BTU/hour from liquefied gas (butane, propane or isobutane) or hydrocarbon fuels (kerosene, white gas or unleaded fuel).

TABLE 1

COMPANY	PRODUCT	BTU/H OUTPUT	EXTREMELY COLD TEMPERATURE ⁱⁱ	BOIL TIME	AUTONOMOUS BURNING TIME
SolHuma	Vital Stove™	20,000	✓	3¼	2,400
Brunton	Raptor	11,000		4	90
Brunton	Flex	12,000		3	70
Coleman	Exponent Xpert	12,000		4	28
Coleman	Exponent F1	16,400		3 ½	44
MSR	SuperFly	10,000		4	52
Primus	MicronStove	7,500		4	39
Vargo	Titanium Jet-ti	9,000		4	n.a.
Coleman	Feather 442	7,500	✓	3 ½	57
MSR	WhisperLite Jet	11,000	✓	4	94
Primus	Gravity Varifuel	10,500	✓	4	n.a.
Primus	Multi-Fuel EX	10,500	✓	4	n.a.



As shown in Table 1, all cooking devices have a similar boil time (time in minutes required to bring 1 liter of water to its boiling point in a covered pot), but the autonomous burning time (time in minutes before refueling or replacing the power source) of liquefied gas or hydrocarbon fuel stoves is interrupted every 30 to 90 minutes for canister replacement. Unless these devices are connected to a fuel tank, they are most effective in outings of short duration. In contrast, the Vital Stove™ generates uninterrupted heat for up to 40 hours (2,400 minutes) before replacing its batteries. The stove creates intense heat from an AA battery powered speed fan that drives oxygen into the combustion chamber, creating a forced ventilation system that provides intense heat and efficient burning. Moreover, it is highly effective in any ambient temperatures, including -40 °C.

«After using the Vital Stove on a four day canoe trip in Northern Ontario, I must say that I was very impressed with the compact size, durability, flexibility of fuel source, and especially the range of heating capacity available with the damper and dual speed fan settings. The Vital Stove is well suited for backcountry travel in wilderness areas across Canada and beyond. »

Stephen Ritchie, Assistant Professor and Coordinator
Outdoor Adventure Leadership Program, Laurentian University, Ontario

SECTION 2 - The Vital Stove™ is environmental, safer and using readily available biomass fuels

The Vital Stove™ is environmentally friendly because its biomass fuels do not add greenhouse gases, nor does it create hazardous wasteⁱⁱⁱ. It is safer because it can be stored everywhere, in contrast with hazardous fuel cooking devices. While the Vital Stove™ can be safely shipped by air, cooking stoves using hazardous fuels can't, unless the stove pipes have been thoroughly cleaned. In a disaster recovery situation, the Vital Stove™ can be shipped safely by air and its low maintenance biomass fuels can be found everywhere. In comparison, hydrocarbon fuel such as Kerosene can be found easily worldwide but causes frequent clogs in cooking stove pipes. White gas is a cleaner hydrocarbon fuel, but it is very difficult to find it outside North America.

TABLE 2

COMPANY	PRODUCT	RESTRICTED AIR SHIPPING & TRANSPORTATION	GREENHOUSE GAS ADDING	REQUIRED FUEL
SolHuma	Vital Stove™			Biomass
Brunton	Raptor	✓	✓	Isobutane
Brunton	Flex	✓	✓	Isobutane
Coleman	Exponent Xpert	✓	✓	Butane/Propane
Coleman	Exponent F1	✓	✓	Butane
MSR	SuperFly	✓	✓	Isobutane
Primus	MicronStove	✓	✓	Isobutane
Vargo	Titanium Jet-ti	✓	✓	Isobutane
Coleman	Feather 442	✓	✓	White Gas/ Unleaded
MSR	WhisperLite Jet	✓	✓	White Gas
Primus	Gravity Varifuel	✓	✓	White Gas/Kerosene
Primus	Multi-Fuel EX	✓	✓	White Gas/Kerosene

SECTION 3: Compact, lightweight, storable and cost effective

Whether it is carried in a backpack or shipped in a box, the Vital Stove™ is compact and lightweight. A canister filled with liquefied gas reduces the portability of a cooking stove because it adds from 200 to 1000 grams in weight (and increases its cost of operation). Also, because most canisters have a tubular shape their storage can be an inconvenience. In contrast, the Vital Stove™ is foldable and lies flat, which increases storage capability, and is cost effective because its biomass fuels are readily available in all situations at no cost, and its retail price is competitive.

TABLE 3

COMPANY	PRODUCT	SIZE (centimeters)	WEIGHT (grams)	RETAIL PRICE
SolHuma	Vital Stove™	20.4 x 12.5 x 4.6	700	\$69.00
Brunton	Raptor	4.3 x 3.8 x 6.4	142	\$40.99
Brunton	Flex	8.1 x 7.4 x 3	96	\$79.00
Coleman	Exponent Xpert	26.7 x 11.4 x 11.4	383	\$52.95
Coleman	Exponent F1	11.2 x 7.6 x 7.1	147	\$59.95
MSR	SuperFly	10.4 x 10.2 x 6.9	127	\$49.95
Primus	MicronStove	6.6 x 6.6 x 4.3	93	\$55.00
Vargo	Titanium Jet-ti	8.9 x 7	76	\$64.95
Coleman	Feather 442	15.9 x 13.3 x 13.3	624	\$58.00
MSR	WhisperLite Jet	15.2 x 10.2 x 10.2	368	\$69.95
Primus	Gravity Varifuel	10.2 x 10.2 x 4.1	238	\$79.00
Primus	Multi-Fuel EX	16.5 x 8.9 x 8.6	357	\$94.95

Conclusion

The Vital Stove™ is a single and affordable energy source for heating, cooking and water purification that uses endless safe solid biomass fuel supply, and doesn't require fuel canisters to manage or transport. This environmental cooking stove works at any ambient temperature, including -40 °C, and is highly portable, compact and easy to store and ship by air. Highly efficient and reliable, the stove can be easily deployed in emergency situations. The Vital Stove™ increases chances of survival, and was designed with the needs of NGOs, governments, individuals and outdoor enthusiasts in mind.

ⁱ A BTU (British thermal unit) is a basic measure of thermal (heat) energy. One BTU is the amount of energy needed to heat one pound of water one degree Fahrenheit, measured at its heaviest point. A BTU is also the equivalent of approximately a third of a watt of electrical power.

ⁱⁱ The Vital Stove™ is highly efficient in temperatures below freezing point, including (-40° C). Stoves using liquefied gas canisters (butane, propane, isobutane) show a decrease in performance or a complete failure at low temperatures. This is due to the lack of effective gas pressure once the temperature of the canister drops below the boiling point of the fuel. When fuel fails to build up enough pressure to effectively feed the stove, it slows down and eventually stops. Propane boils at -40° C, butane boils at 0.5° C, and isobutane boils at -12° C. In cold weather, stoves using hydrocarbon fuels (kerosene, white gas, and unleaded fuel) are more reliable; however their effectiveness will decrease below -20° C.

ⁱⁱⁱ Disposal of empty fuel canisters poses a problem as even when empty they can explode when crushed by a trash compactor. In order to safely recycle or dispose of empty canisters, they should first be punctured. Canisters not punctured are considered hazardous waste.