



# THE ULTIMATE GUIDE

TO BUYING  
AN OUTDOOR  
FURNACE IN  
2022

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AND 5 COSTLY  
MISTAKES TO  
AVOID



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## FAQ

Diving into the world of outdoor wood boilers can be intimidating. But you're not alone. By the end of this guide...

**1** You will know what to look for in a boiler.

**2** You will be aware of 5 costly mistakes to avoid.

**3** You will be equipped with feedback from actual boiler owners.

# BOILER BASICS



## What is an outdoor wood boiler?

While commonly known as an outdoor wood boiler or OWB, the engineers will argue the technical term is a 'hydronic furnace', referring to the fact heat is transported using circulating water.

Water is actually a great way to store and transform heat. You can install uninsulated pipe in your home and enjoy radiant in-floor heat, or you can use heat exchangers for a traditional forced-air heating system or baseboard heaters, not to mention heating hot tubs and domestic hot water.

## What's the benefit of an outdoor wood boiler?

Just a little thing we like to call 'Saying Goodbye To Your Winter Heating Bill' and 'The Feeling of Complete Heating Independence'.

Not to mention a cozy, warm home, shop, and garage. Plus free heat for your hot tub, your pool in the summer, and domestic hot water year-round... imagine never running out of hot water again.

The benefit to heating with wood is obvious and immediate to your monthly energy bill; if you can source wood yourself, you can really say goodbye to relying on energy companies for propane, electricity, or natural gas, all of which we have seen fluctuate wildly on price.

Wood is a renewable resource. And properly burning wood fuel releases the same amount of carbon as decomposing biomass, making it a carbon-neutral process.

## How much money would I save?

Every building and region is different, but on average, it's estimated a home in the Northern U.S and Canada needs 100 million BTUs each winter.

So if you're paying \$2.50/gallon for propane, you can expect a total heating bill of \$2,881 each winter.

If you have the time and expertise to collect and season your own wood to feed your outdoor furnace, it's easy to see how those costs become annual savings.

## Gasification or Conventional outdoor furnace? Which is best?

The process of gasification is a way to greatly supercharge your efficiency. You superheat your wood and unlock the gases trapped inside, burning them for even more BTUs. While gasification seems like the obvious choice, the more high-tech appliance means higher costs, and they require seasoned wood.

While not as efficient, a conventional furnace can be a lot more forgiving when it comes to your fuel quality and is incredibly simple to operate.

## How do I figure out the right furnace size?

It all comes down to the number of BTUs you need per hour to keep your buildings at the desired temperature. This calculation requires some math, but a licensed dealer should be able to do a heat loss equation for each of your structures.

If you discover you need 62,009 BTUs/hour to keep your home and shop toasty, a furnace like the HeatMaster<sup>SS</sup> G4000 would work well because it can put out approximately 68,000 BTUs/hour.

## How do I source and season wood?

With some sweat equity, preparing and seasoning wood demands only your time, the cost of necessary equipment (chainsaw, wood splitter, trailer or truck, etc.)

If you already have the equipment and don't mind getting your hands dirty, your fuel cost is essentially "free".

Plus you're guaranteed some great workouts, you can cancel that gym membership!

For the best burn, season your wood to a 15-25% moisture content. Too much moisture lowers efficiency (you're BTUs are being wasted evaporating water) and increases maintenance due to a buildup of creosote, a byproduct of wood combustion that consists mainly of tar.

Typically it takes 24 months to season wood. Make sure to store wood in a covered, well-ventilated area. Seasoning occurs more quickly when your wood is split. You can test your wood's moisture level on the long side of the wood after splitting with a wood moisture meter (a handy gadget!). Don't test the end as that will always be the driest part and make you think your wood is drier than it is.

In general, hardwoods are better than softwoods as they typically burn cleaner and provide a better coal bed which prevents your fire from going out.

### PRO-TIP FROM REAL BOILER OWNERS

*"I've always wanted a boiler that I could run at my place with wood as a heat source. I love doing wood on our ranch because it's free of charge, I just have to go get it!" - THE ZELL FAMILY*



A large black outdoor furnace with the HeatMaster G4000 logo on its door. The door is slightly ajar, revealing internal components. The background is a clear blue sky.

# 5 COSTLY MISTAKES

## TO AVOID WHEN PURCHASING AN OUTDOOR FURNACE

Choosing your heating system is a major decision, and never one to be made lightly. And while there are huge benefits to outdoor furnaces, there are a few mistakes that could cause you major headaches down the road. However, the good news is you can easily avoid them.

### FIRST costly mistake to avoid

**Don't take the easy way out and use wet, unseasoned wood.**

Wet wood means wasting all your BTUs on evaporating water inside the firebox rather than heating your home. Wet wood is also hard on your furnace and causes headaches down the road including the build-up of creosote, a sticky tar-like substance that will plug up your system.

**What kind of wood do I want?**

The gold standard in wood heat is dense, hardwood with a 15-25% moisture content. Purchasing a wood moisture tool is the most accurate way to determine your wood's moisture content. Another clue is the sound it makes when smacked against each other, you should hear a sharp \*clank\* rather than a dull \*thud\*.

Depending on the type of wood, it can take around two years for your pile of cut lumber to lose the necessary moisture for an optimal burn.

### SECOND costly mistake to avoid

**Don't oversize, or undersize, when picking a furnace model.**

A furnace that's way too big for your heat draw will idle for long periods and cause you headaches down the road thanks to creosote, more smoke, and higher maintenance. A furnace that's far too small will burn through your wood supply and never quite catch up. Short burn times = filling more often and making it difficult to maintain your ideal temperature in severe cold.

Instead, you want to size your furnace so that it gets a good workout. Gasification furnaces like to work hard especially. But your furnace should always be able to meet the maximum heat demand required. Your local dealer will help "right size" your wood boiler for your heating needs.

### THIRD costly mistake to avoid

**Don't cut corners when it comes to pipe.**

You will NEVER, EVER regret buying high-quality insulated pipe. While some may be tempted to save money when it comes to pipe, they only end up losing precious BTUs as the ground will absorb an infinite amount of heat. The more heat you lose to the ground the more wood you'll use this winter, and next winter and the winter after...

With cheaper pipe, you'll eventually have to dig them all up and try again because it lacks durability. In the end, solid core closed-cell foam is best. Meanwhile, pipe with drain tile covering tends to split or crack.

I know it stings now, but when it comes to pipe, do it once and do it right.

### FOURTH costly mistake to avoid

**Don't neglect to have your furnace water tested annually.**

Water has the ability to eat through almost any metal on Earth. But with the right treatment and regular monitoring, your water will do its real job... transfer heat to your home. It may be a hassle to have your furnace water tested every year but it's an important way to ensure the longevity of your water jacket. Typically, you want to test for conductivity, pH level, and nitrites.

Conductivity is a measurement of the minerals in your furnace. While it's common for water to contain minerals, too much can cause problems like scaling and corrosion in a hydronic system.

pH is a measurement of alkalinity, which determines whether you have hard or soft water. Again, it's best for outdoor furnaces to have harder water as the active ingredients in the water treatment neutralize hard water easier than softer water.

Nitrites are the active units of water treatment available to neutralize harmful elements like bacteria that can build up in the furnace water over time.

### FIFTH costly mistake to avoid

**Don't neglect to have your furnace water treated with the recommended treatment.**

After receiving your water test results from a certified dealer, make sure to follow the recommendations for treatment.

For example, HeatMaster<sup>SS</sup> offers a custom-designed treatment for wood and coal boilers to create a chemical armor film. This armor contains multiple active ingredients to prevent scale, sludge, corrosion, and oxygen pitting. It also helps to maintain proper pH and alkalinity levels in your water system.

HeatMaster Wood Burning Furnace Water Treatment also contains a special volatile corrosion inhibitor that vaporizes into the water vapor itself to help prevent corrosion above the waterline. This provides extra protection wherever water vapor contacts metal surfaces.



# WHAT TO LOOK FOR IN AN OUTDOOR FURNACE

## Is The Furnace Easy To Use?

When choosing an outdoor furnace, look for one that's easy to operate, not only for yourself but for friends and family members who will keep the furnace going when you're away.

Important features include:

- The ability to vent smoke while loading
- Removable ash pans and dump feature to make clean-up easy
- The ability to quickly clean heat exchange tubes
- The furnace comes with legs (a base that sits on the ground can rust and you'll have to insulate it yourself)

### PRO-TIP FROM REAL BOILER OWNERS

*"I cleaned my buddy's ash out of a competitor's gasification boiler for him while he was in the hospital. What takes me 5-10 minutes max every few weeks to clean the ash from my G200 took me almost an hour to do in his unit, plus I had to lay on the ground to see into the ash chamber and got all dirty with ash which doesn't happen with the HeatMaster."*

**- NOAH PARONISH**

## Will The Furnace Save You Money?

The most common questions for new owners are: How Much Wood Will I Need? AND How Often Will I Be Loading The Firebox? Why these questions? Because you don't want to run out of firewood in the middle of winter, and you don't want to be getting up in the middle of the night to load your furnace.

That's why you want a furnace with a high-efficiency rating; using less wood and getting more heat. It's a big reason to consider a GASIFICATION furnace. Gasification refers to the process of superheating the gases trapped in a fuel source like wood and burning them to get the maximum BTUs.

## How Long Will My Boiler Last?

A wood boiler has the potential to last decades. However, a big differentiating factor is construction quality and materials, especially when it comes to choosing mild steel or Titanium-enhanced 409 Stainless Steel.

You want a firebox and water jacket made of Titanium Enhanced Stainless Steel. Titanium-enhanced Stainless Steel is coated with a chromium film and reduces corrosion from wet ashes or creosote in your firebox, sweating on your water jacket, or other corrosive elements in your water.

Titanium Enhanced Stainless Steel can also withstand higher continuous temperatures, something your boiler will be producing day after day. It also transfers more heat, which means BTUs transfer to your water jacket at a higher rate, saving you more fuel.

Finally, Titanium Enhanced Stainless Steel has a low Thermal Expansion Rate, which means it won't crack or warp in a high heat environment.

And unlike Titanium Enhanced 409 Stainless Steel, mild steel has very little resistance to corrosion and has a low continuous temperature tolerance.

### PRO-TIP FROM REAL BOILER OWNERS

*"When I was researching outdoor wood boilers, HeatMaster<sup>SS</sup> was one of the first ones I found and looked into. I regretfully moved on to other brands because I figured with the build quality, design, fit and finish of those stoves, it was going to be out of my price range. After getting quotes and researching all the other top brands, I circled back and just figured I'd get a price to round out my estimates. As soon as I got the quote and realized how affordable it was, I was 100% on board. I ordered it and it changed my family's life! I've not looked back."*

**- JP SPRAGUE**

## Warranty

When it comes to peace of mind and protecting your investment, you'll want to take a close look at the warranty whenever you make a large purchase. Don't forget to read the fine print!

## Customer Support

But perhaps the greatest asset to any brand of outdoor furnace is their commitment to customer support. Take a close look at the dealer network and especially the dealer in your area; they'll be the one you call when you have questions or require warranty service and support. Make sure expectations are clear.

### PRO-TIP FROM REAL BOILER OWNERS

*"Buying a unit comes down to who will answer the phone when you need a question answered. Pineview Woodstoves was the nearest HeatMaster<sup>SS</sup> dealer, which was a bit of a haul, but they were great to deal with."*

**-SHAINE PEARSON**

## How does the furnace tie into my house?

You may require a water-to-water or water-to-air heat exchanger to transfer heat energy from the hot water your furnace has produced. A HeatMaster<sup>ss</sup> furnace can tie into almost any system and provide heat in a number of applications. For example, forced air, in-floor, baseboard, domestic hot water etc. Remember, your wood boiler is designed to supplement your existing heating system, not replace it. If you're not there to feed your wood boiler your existing system takes over.

## How much wood will it use?

Good question! And not a simple one to answer. Because every situation is unique, your best bet would be to speak with a dealer in your area that is familiar with your region's winters, the type of wood available, and what other users are burning on average in the area.

The type of furnace makes a big difference as well. Through the process of gasification, a G Series furnace can achieve longer burn times compared to a conventional furnace and reduce wood consumption by nearly 50%.

How much wood you use will depend on your BTU needs, but on average you can expect to reload your furnace once or twice a day if your furnace has been sized correctly.

### PRO-TIP FROM REAL BOILER OWNERS

Cutting and prepping wood can also be an opportunity for making family memories and passing on values like the importance of hard work.

*“Six-year-old Preston has really been watching and learning over the years and hopefully it will stay with him in the future. It really is a family event at the woodpile and it gives us a sense of independence knowing where our heat and hot water are coming from... Won't be long till little Josie is helping us toss wood into the back of a trailer and once again, learning the work ethic we all need to learn.”*

**-DARIN FRONABARGER**

## How much wood will it REALLY use?

Ok, I see you are serious about this one. The short answer is... it depends.

The long answer is there are many factors that determine how much wood you'll burn including your furnace's efficiency, wood quality, average temperatures over the winter, your building's insulation level, and heat load.

Wood quality also determines how many BTUs are available. Heavy woods like oak or ash can produce approximately 16 million BTUs per dry cord. Lighter woods like aspen or willow may have closer to 9 million BTUs. The moisture content of your wood is also a factor, as wet wood can siphon off 40% of the heat your furnace is generating. You are basically just burning wood to evaporate the water in your wood.

Your buildings' heat load will also determine how much fuel you burn. Heating a small, well-insulated home during a mild winter will require a lot less heat than say a large, poorly insulated shop over a frigid winter.

All of these factors come into play when determining how much wood you'll burn to raise your buildings to your desired temperature.

In the end, talking to a qualified dealer is the best bet to determine the right size of furnace for your heating demands.

## How much time does it take to season wood?

Typically it takes at least 12 months to properly season wood. Anything over 10" diameter should be split to season faster. It's always recommended to use seasoned wood with a 15-25% moisture content. The more accurate way to test your moisture content is using a moisture meter. The moisture meter pins should be pressed into the grains of the wood, parallel to the wood grains. Make sure to take at least 2-3 readings from different points of the wood after you just split it. Testing the side of the wood that has already been drying for a few months won't give you an accurate reading of your fuel's moisture content.

## How should I store my wood?

Store your woodpile under an open-ended shelter to avoid rain and snow buildup on the pile. Keeping three sides open will allow the sun and wind to season the wood. Do not keep the wood in a woodshed or under a tarp during the summer as the moisture that evaporates from the wood will have nowhere to go. Also stack the bottom layer on pallets, crushed rock, concrete, etc. but not on bare ground. Your firewood will absorb moisture from the ground and take longer to dry... if it dries at all.

## Where should you put your furnace? How far does it have to be from a building?

When choosing the location for your furnace, consider prevailing wind direction, distance from your home, and wood storage for refueling. The minimum clearance to combustibles is 6" and 24" from the front of the furnace. Furnaces like The G Series with a smoke bypass can also be installed indoors such as in a garage or shop. It's also never a bad idea to talk to your insurance provider. If they have any questions you can always refer them to your dealer.

## Can I install it myself?

Installation should be performed by a qualified installer or under the supervision of a qualified installer and must comply with all requirements of your local agency with jurisdiction.

## Do you sell parts?

Your local dealer will be your one-stop-shop for all your parts and service needs.

## How long does a boiler last?

If you take care of your boiler with regular cleaning and sending in water samples, your boiler can last you decades. We also back each furnace with our best-in-industry Lifetime Limited Warranty. We believe you should deserve to sleep easy knowing your investment is secure for decades to come.

## How deep does the RhinoFlex have to be buried?

-We recommend trenches are dug 24" to 36" deep, and wide enough to install your water lines. If possible, have a gradual

slope in your trench to allow drainage away from your lines and out the trench bottom. Last-minute installation and the grounds already frozen? No problem, RhinoFlex can be left on the surface till Spring thaw happens and you can bury it then.

## How is stainless steel better than mild steel?

HeatMaster furnaces use 409 Titanium Stainless Steel coated with a chromium film so it will not corrode from wet ashes or creosote, sweating on your water jacket, or other corrosive elements in your water. Unlike mild steel, it can withstand higher continuous temperatures and transfers more heat to your water which saves you fuel. 409 Titanium Stainless Steel also has a lower Thermal Expansion Rate compared to mild steel, which means it won't crack or warp in high heat environments.

## Where are HeatMaster<sup>ss</sup> furnaces made?

HeatMaster<sup>ss</sup> furnaces are made in Manitoba, Canada. We know cold. Manitoba winters can drop the mercury to -40 F overnight and remain below 0 F for weeks. However, out of our frozen north, we test and build some of the toughest outdoor wood boilers because they're forged in the toughest climate.

## Why the price?

HeatMaster<sup>ss</sup> furnaces are not cheap for a good reason. We don't use cheap materials. If we did, they wouldn't last as long as they do. We also invest heavily in research and development. Without it, they wouldn't have the convenient features that we've designed and they just wouldn't be HeatMaster<sup>ss</sup>. Thankfully, HeatMaster<sup>ss</sup> furnaces will never be cheap. Because you always get what you pay for.



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