

Chapter 1

What Is a Masonry Heater?

A heating system unlike any other

A masonry heater burns a full load of dry wood in 2 to 3 hours, stores that heat in its masonry mass, and then radiates it slowly and evenly into your living space over the next 12 to 24 hours. It is the cleanest, most efficient way to burn cordwood available in North America today.

A Heating System Unlike Any Other

A masonry heater is a wood-burning heating appliance built from dense, heat-storing masonry materials - firebrick, refractory castings, stone, or tile - that stores a large amount of heat energy from a short, hot fire and then radiates that heat slowly and evenly into your living space over the next 12 to 24 hours.

Because the heater stores heat in its mass rather than releasing it immediately, you can burn wood at its most efficient temperature - fast and hot, with near-complete combustion - without overheating your home. The fire is done in two hours. The warmth continues all day.

This is fundamentally different from every other wood-burning appliance available in North America. A wood stove releases heat as fast as it burns, which means to stay comfortable you constantly regulate the fire - often by damping it down, which produces smoke, creosote, and incomplete combustion. A fireplace sends roughly 80 to 90 percent of its heat straight up the chimney. A masonry heater does neither of these things.

A Brief History: 1,000 Years of Masonry Heating

Masonry heaters are not new technology. They are among the oldest and most refined heating systems in human history. From the 10th century onward, homes throughout Europe were heated with wood-burning masonry stoves. By the 15th century, wood shortages had become a serious crisis across the continent, and European governments began investing heavily in more efficient stove designs.

Kings in Prussia, Sweden, Norway, and Denmark commissioned their craftsmen and architects to develop better designs. This concentrated effort over two centuries produced the modern contraflow masonry heater - a design that has remained essentially unchanged because it is already close to optimal.

In Germany, roughly 19,000 masonry heaters are built every year by trained craftsmen working in a dedicated trade. All of North America builds fewer than 1,000. The gap is not about quality or performance. The gap is about education. That is why this guide exists.

How a Masonry Heater Works

Thermal Mass: The Secret to Masonry Heat

When you fire a masonry heater, the hot combustion gases travel through a series of internal channels that maximize their contact with the surrounding masonry before exiting through the chimney. By the time the

gases leave the heater, they have surrendered most of their heat to the mass. Exhaust temperatures from a masonry heater chimney typically run between 200 and 300 degrees Fahrenheit. A conventional wood stove or fireplace may exhaust gases at 600 to 900 degrees, sending most of that energy straight outdoors.

All of that captured heat then slowly radiates back into your living space over the next 12 to 24 hours, keeping your home at a comfortable, even temperature.

Rapid, Complete Combustion

Because the masonry mass stores the heat, you do not need to regulate the fire to control your room temperature. You burn a full fuel charge - typically 35 to 65 pounds of wood depending on your model - as hot and fast as the firebox allows. The fire burns completely in about two hours.

Wood gases must reach approximately 1,100 degrees Fahrenheit to ignite and burn completely. In a masonry heater operating at full fire, combustion temperatures routinely exceed 1,500 degrees Fahrenheit. Almost nothing escapes unburned. Particulate emissions have been independently tested at less than 1 gram per kilogram of wood burned. Open fireplaces average over 17 grams. Conventional wood stoves average over 15 grams. Even EPA Phase II certified wood stoves average over 7 grams.

The US EPA classifies masonry heaters as non-affected facilities - specifically excluded from certification requirements because they already meet or exceed the spirit of what certification is trying to achieve.

Emissions testing data: <https://solidrockmasonry.com/particulate-emissions-testing/>

View completed heater gallery: <https://solidrockmasonry.com/gallery/>

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