HPBA
Hearth, Patio & Barbecue Association

FACTSHEET

WOOD BURNING FAQs

Straight Answers to Burning Questions: Quick Tips For Cleaner, More Efficient Wood Heat

THE BENEFITS

Many benefits result from the decision to heat with wood:

- Wood heat contributes to the conservation of the world's non-renewable fossil fuels.
- Wood heat enhances the nation's energy independence.
- Heating with wood will save you money.

However, linked to these benefits is the environmental responsibility to burn as clean and efficiently as possible. This guide will address information on proper wood burning and provide tips to help you burn smart and with low emissions to help protect your local environment.

RESPONSIBLE WOOD BURNING

Heating with wood is an American tradition. Yet, wood burning in the past decade has bore little resemblance to wood burning done in the 1970s -- or even the mid-1980s. Today, important technological advances have resulted in a new breed of clean burning, high efficiency wood stoves, fireplace inserts and fireplaces, as well as cleaner burning fuels, such as wood pellets and manufactured firelogs. However, with this new technology comes the responsibility of proper wood burning techniques.

When heating with wood, there are four critical elements to help achieve optimal economy, environmental responsibility and efficiency form a wood stove or wood burning fireplace insert:

(1) The Wood Stove or Fireplace Insert

(2) The Installation

(3) The Operator

(4) The Fuel

THE WOOD STOVE OR FIREPLACE INSERT

Q. "How can I tell if a wood stove is a new clean burning, high efficiency model?"

A. Regulations enacted by the U.S. Environmental Protection Agency (EPA) require all wood stoves and fireplace inserts manufactured and sold after July 1, 1992 to pass stringent emission tests. An EPA label identifies a stove as a new clean burning, high efficiency model, and is found on every certified stove or insert.

Q. "How can I tell if a stove or insert is sized right for my home?"

A. Consider your geographic location and climate, the number of rooms you wish to heat, and construction features of your home such as room size, ceiling height, and insulation. Ask a Hearth Specialty Retailer for information on the best stove for your space heating requirements. To locate a Hearth Specialty Retailer go to www.woodstovechangeout.org.

Q. "I already have an older stove. Is there anything I can do to make it burn cleaner?"

A. Yes. Even if you can't upgrade to a new EPA-certified stove or fireplace insert right away, you can still improve the performance of your current stove. Have your wood heating system inspected by a certified Hearth Specialty Retailer or by CSIA Certified Chimney Sweep to ensure it has been properly installed. To locate a HEARTH Certified Specialist go to www.hearthed.com or to locate a certified sweep, go to www.csia.org.

Ask the professional if your stove can be retrofitted with a catalytic combustor. While this improvement won't make your stove EPA-certified it has the potential to increase the efficiency of your appliance. You can also reduce emissions by burning only well-seasoned firewood or by starting your fire with a firelighter product.

THE INSTALLATION

Q. "When installing a wood stove, what's the first thing I should consider?"

A. That the wood stove and chimney work as a system. It is important for the stove's chimney system be sized properly, according to manufacturer's instructions. Whether venting into a masonry or metal system, make sure the diameter of the chimney matches closely, but never smaller than, the size of the stove's flue outlet. Doing anything else adversely impacts emissions and safety.

Q. "Can I install my own stove, or should I have the installation done professionally?"

A. The Hearth Products Association recommends that all stove and fireplace inserts be installed by a specialist certified by the HEARTH Education Foundation. This technician will be familiar with your model and will have installed many others like it. This experience can save you time, money and frustration in the long run. Plus, it gives you the confidence your stove is installed properly and safely. For owners who choose to install their own wood stoves, follow the manufacturer's instructions explicitly. NEVER proceed without professional advice if you have a question. To locate a HEARTH certified specialist, go to www.hearthed.com.

Q. "Where can I find a qualified installer?"

A. A Hearth Specialty Retailer can provide you with professional installation assistance. Ask the retailer about the installer's credentials. Does the installer have experience with the make and model of the stove you are buying? Is the installer certified by the HEARTH Education Foundation?

Q. "What is HEARTH?"

A. HEARTH is a nonprofit foundation formed to promote the safe and efficient installation, maintenance and operation of solid fuel appliance systems. The foundation offers educational programs designed to upgrade the skills of professional installers and fire code inspectors. HEARTH certification credentials are awarded to professionals who pass a comprehensive examination. Credential must be renewed every three years to remain valid. To locate a HEARTH certified specialist, go to www.hearthed.com.

THE OPERATOR

Q. "How can I tell if I am operating my wood stove properly?"

A. Check the exhaust coming out of your wood stove chimney; the smoke is your operational barometer. If your fire is burning properly, you should only see the white transparent steam of evaporating water, darker and opaque smoke will only be slightly visible. The darker the color of the exhaust, the less efficiently you are operating the appliance. It may be necessary to adjust the operation of your wood stove to decrease the opacity of the exhaust (that is, the density of the smoke). A 15% opacity level indicates efficient operations, while a 90% level reflects unacceptable polluting conditions; some state regulate opacity levels from wood stove chimneys.

Q. "Why is wood smoke undesirable?"

A. Smoke, in the form of solid particles ("particulates") and volatile gases, is unburned fuel. An improperly operated wood stove fails to achieve the high combustion temperatures necessary to burn the particulates and ignite the gases. These gases and particulates contain half the heating potential of your firewood. The loss of this fuel up the chimney amounts to a loss of efficiency. Improperly operated wood stoves can also adversely affect air quality. However, the use of EPA-certified wood stoves and wood burning fireplace inserts, combined with the proper operation of all wood burning stoves and inserts, can decrease the level of polluting emissions by up to 85 percent.

Q. "Are there times when my wood stove or fireplace insert will emit more smoke?"

A. There are two periods in the operation of a wood stove most vulnerable to creating smoky emissions -- during startup and during refueling. However, these smoky periods can be dramatically minimized by proper operation.

Q. "What can I do to minimize the amount of smoke at startup and refueling?"

A. Create the drafting conditions necessary to maintain clean combustion. "Good drafting condition" occurs when your chimney consistently draws air into the wood stove at a high enough rate to prove adequate oxygen for complete burning. To create this draft, you must "preheat the chimney." Some chimneys require longer preheating periods than others, depending upon their height, outside exposure and construction. Typically, preheating requires 5-15 minutes of vigorous firing.

Q. "How do I preheat my chimney?"

A. At startup, remove all but a thin layer of ashes from your firebox. Insert five or six crumpled individual pieces of newspaper and dry finely split kindling or a firelighter. Firmly open the air supply (dampers) to the woodstove and ignite the paper on all aides. You may find it necessary to leave the stove door slightly ajar during the first few moments of the fire. After the first load ignites, add more kindling until the chimney is preheated. The fire should burn briskly and full of flame during the startup if you are operating the wood stove properly.

When reloading, place finely split pieces of wood on the charcoal bed and fully open the air supply. Using smaller pieces of wood during reloading encouraged rapid reheating of the chimney.

You'll know the chimney is preheated when each large piece of wood you add to the fire burns vigorously, without a loss in intensity of the fire. Keep listening to the sound of the air entering the stove. A constant and rising movement of air signals that good drafting conditions have been achieved.

Some wood stove manufacturers provide specific guidelines for startup and preheating phases involving the indirect monitoring of chimney exhaust temperatures. Typically, chimney connector temperatures must reach 500-600 degrees F. before the chimney is fully primed. Follow your manufacturer's instructions when temperature and startup procedures are specified.

Q. "Once I have preheated my chimney, how should I operate the stove?"

A. Although all wood stoves require preheating during startup and reloading, their operation afterwards vary somewhat. Wood stoves using catalytic combustors require the monitoring of temperatures and air supply to ensure the catalyst engages at appropriate times in the combustion cycle. Generally, catalytic stoves require lower combustion temperatures in the firebox to burn cleanly. At 500-1000 degrees F., the catalyst ignites, burning the volatile gases and particulates. Non-catalytic stoves attain much higher temperatures in the combustion path before the gases and particulates burn. Always refer to your wood stove manufacturer's operation manual and follow the instructions for your particular make and model.

Q. "Do I operate my stove differently in cold vs. warm weather conditions?"

A. Yes. During the warmer seasons of spring and fall, control the total heat output by limiting the amount of fuel (wood) rather than by closing down the air supply. Make shorter, hot fires using more finely split wood. The actual air supply setting will vary according to your stove instruction, but the fuel loading will be consistently smaller. Let the fire burn out rather than smolder at low air supply setting. When your home requires more heat, restart the fire with kindling as always, but add smaller fuel loads. This allows your stove to operate at maximum efficiency and with minimum emissions. Avoid the temptation of building a big fire and then starving it for air.

Q. "Is it important to have my stove and chimney cleaned?"

A. Yes. Smoke rising through your chimney may condense and build up on the cooler inside walls forming a substance known as creosote. The volatile substance can ignite and burn in the chimney. Many chimneys and installations are unable to withstand these dangerous creosote fires; the results can be tragic. Chimneys and vents for wood stoves and inserts also perform the necessary function of directly venting the hot gases from a fire away from the house. If the chimneys or vents are obstructed by debris or animals the hot gases can be forced back into the home. At the same time, wood stoves and inserts require service to ensure they are operating correctly.

Q. "How often should I have my chimney inspected and cleaned?"

A. The Chimney Safety Institute of America recommends that all chimneys and vents be inspected on an annual basis and cleaned as necessary. However, frequent stove or insert use may require monthly chimney inspection and cleanings. Wood stove or wood burning fireplace connectors (stove pipes) should be checked as often as every 2-4 weeks. A CSIA Certified Chimney Sweep can show you the proper methods for these more frequent inspections and can provide valuable insight into the proper working of your chimney and/or vents. For more information about chimney safety, go to www.csia.org or call 1-800-536-0118.

Q. "How often should I have my wood stove or fireplace inserts serviced?"

A. The HEARTH Education Foundation manuals recommend at least annual inspection/service/maintenance for solid fuel appliances and venting systems. The basis for that recommendation for solid fuel appliances is the National Fire Protection Association standard NFPA 211.

Q. "How can I make my fireplace produce less emissions so that I can still enjoy a wood fire"?

A. You can install an EPA-certified wood burning insert or you can burn a manufactured firelogs which produces more than two-thirds emissions than firewood burned in an open hearth fireplace.

THE FUEL

Q. "Does it matter what kind of wood I use?"

A. Your fuel supply should consist of a mixture of hardwoods, like maple or oak, and softwoods, such as fir and pine. When first starting your fire, use softwoods. They ignite easily and burn rapidly with a hot flame. Hardwoods provide a longer lasting fire and are best used after preheating the chimney. If hardwoods are unavailable, you can control your fire's burn rate by using larger pieces of wood.

Q. "Is it important to season wood before burning it?"

A. The seasoning, or drying, process allows most of the natural moisture found in wood to evaporate, making it easier to burn. A properly seasoned log will have 20%-30% moisture content. Wood only dries from the surface inward so un-split pieces dry very slowly. To properly season wood, split the logs as soon as possible and stack them in a dry spot for 6-18 months. Pile the wood loosely, allowing air to circulate through the split logs. Hardwoods take longer to dry than softwoods. Humidity and temperature levels also impact drying time.

Q. "What's the best way to load wood into my stove or insert?"

A. Avoid placing pieces of wood in parallel directions, where they may stack too closely. Vary the position of the wood in the firebox to maximize the exposed surface area of each piece of wood. Only use wood properly sized for your stove's fire chamber. Complete wood combustion requires wood (fuel), temperature (heat), and oxygen (air) to burn completely and cleanly.

Q. "Is there anything I shouldn't burn?"

A. Never burn garbage, plastic, foil, or any kind of chemically treated or painted wood. They all produce noxious fumes; these are dangerous and highly polluting. Additionally, if you have a catalytic stove, the residue from burning plastics may clog the catalytic combustor.