

# Fireplaces and Stoves

Consider Efficiency and Low-polluting Approaches to Burning Wood



## SKILL SET

Be sure you have the experience needed for these maintenance tasks. If you are in doubt, hire a contractor.

## SAFETY

Exercise common sense when working with tools.

## TOOLS

Utility knife, power or hand saw.

## MATERIALS

1x2 lumber, insulation board, fabric or alternative covering, chimney pillow.

## COST BENEFIT

If you're not using a fireplace then block it—heat loss through a chimney adds expense to your heating/cooling bills. Wood heat can be inexpensive with the right wood-burning appliance but will require hands-on maintenance.

### PRIORITY LEVEL

LOW MED HIGH

### SKILL LEVEL

DIY PRO

Fireplaces and wood stoves are generally used as supplemental heat for a home but can also be the primary heat source with a modern wood-burning stove or furnace. However, if not used properly, fireplaces and wood stoves can actually waste more heat than they generate and leave the home chilly while consuming lots of fuel.

## Fireplaces

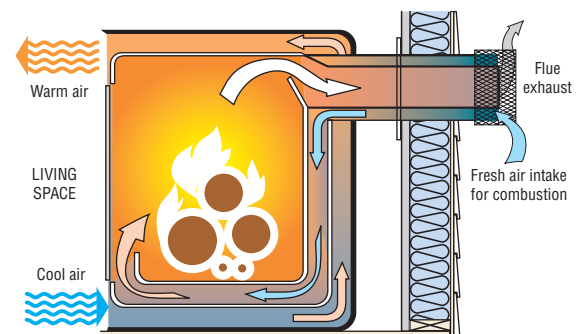
Fireplaces come in many different shapes and styles, including traditional masonry, wood-burning insert and gas insert. The best types separate the combustion process (fire) from the living space using sealed glass doors and a duct that brings outside air into the fireplace to support combustion as well as a flue to exhaust combustion by-products, such as carbon monoxide, moisture and soot.

In general, do not use an open fireplace as a primary heat source. Draft from the operating fireplace sucks heated air from the home and takes it up the chimney if the combustion air for the fire is supplied from inside the house. The amount of hot air that exits the top of the chimney is the same amount of cold, outdoor air that is pulled in through holes and cracks in the floors, walls and ceilings. While sitting next to the fireplace may feel warm, the net impact is that the rest of the house is being cooled instead of heated. It is common for over 90 percent of the heat produced by a wood burning fireplace to be lost up the chimney. It is usually best to limit the use of a fireplace to occasional periods to enjoy the ambiance and turn the thermostat lower so that heated room air will not be lost up the chimney.

When using an existing masonry fireplace be sure to have it inspected by a CSIA or NFI-certified professional before use. A professional inspector will be able to determine if the chimney and liner are structurally sound and if creosote, a highly flammable residue, is present. Creosote buildup is usually caused by burning non-seasoned wood and can cause reduced chimney draft. Creosote and cracks in the chimney liner can lead to chimney and house fires.

Burning wood also produces a large amount of gaseous and particulate pollution, both inside and outside the home, that can cause health problems. The EPA recommends against heating solely with wood fireplaces because of the increased risk of bronchitis and other pulmonary issues, especially for homes with children, elderly and those with poor respiratory health. Combustion also produces carbon monoxide so make sure that a carbon monoxide monitor or detector is installed outside of each sleeping area and on each level of the home.

## Sealed Combustion Fireplace



A sealed combustion fireplace provides fresh air for combustion. A heat-exchanging chamber around the firebox improves the efficiency.

For fireplaces with masonry chimneys, it is best to locate the chimney near the center of a home so that the heat absorbed by the chimney can radiate into the home. Masonry chimneys on perimeter walls lose much of their heat to the outdoors and sometimes experience poor draft due to their cold temperature. The heat stored in an interior masonry chimney provides better draft and allows for longer times between wood replenishment.

Many newer homes have gas fireplaces and do not rely on burning wood. These units are usually vented directly through the wall in back of the insert or up the chimney. Inserts should have glass doors and a dampered outside combustion air duct which permits them to operate with fewer of the efficiency and health issues associated with traditional fireplaces.

Wood and gas standard fireplaces do not typically radiate much heat into the house and are generally better suited for aesthetics instead of heating performance. Some units have enhanced circulation features such as blowers to better distribute room air around the fireplace and improve heat delivery into the home.

Unvented gas fireplaces, like any other type of unvented combustion heating equipment, should be avoided. These units add unhealthy by-products of combustion into the home as well as excess moisture. Some building codes do not allow unvented gas fireplaces.

## Fireplace Best Practices

- Always close the chimney and outside combustion air damper when the fireplace is not in use
- Install a chimney cap to keep out birds and rodents
- Do not leave a fire unattended
- Only burn seasoned wood
- Do not use an unvented fireplace
- Have the chimney inspected yearly by a certified professional
- Install carbon monoxide monitors or detectors

## Wood-burning Stoves

There are approximately 12 million wood stoves in homes today and 9 million of those are older, non EPA-certified stoves that are 50% less efficient than newer stoves.

Upgrading an old wood-burning stove with a new, energy-efficient model can save money and fuel, and reduce the pollutants emitted into the home.

Stoves manufactured prior to 1990 burn wood inefficiently, wasting firewood, endangering health and creating excess emissions. New, EPA-certified wood and gas options are cleaner burning and more energy efficient. Additional information and a list of EPA certified wood stoves is available at [www.epa.gov/burnwise/energyefficiency.html](http://www.epa.gov/burnwise/energyefficiency.html)

## Benefits of EPA Certified Wood Stoves

- Save money, fuel, time and resources
- Up to 50% more energy efficient
- Commonly uses 1/3 less wood for the same heat
- Cut creosote build-up in chimneys and helps reduce the risk of fire
- Produce 70% less particle pollution indoors and out
- Reduced indoor and outdoor wood smoke pollution which has been linked to cancer, asthma and other serious health conditions

Make certain the stove is installed by a professional installer. Check with a CSIA or NFI-certified professional for more information.

## Efficiency

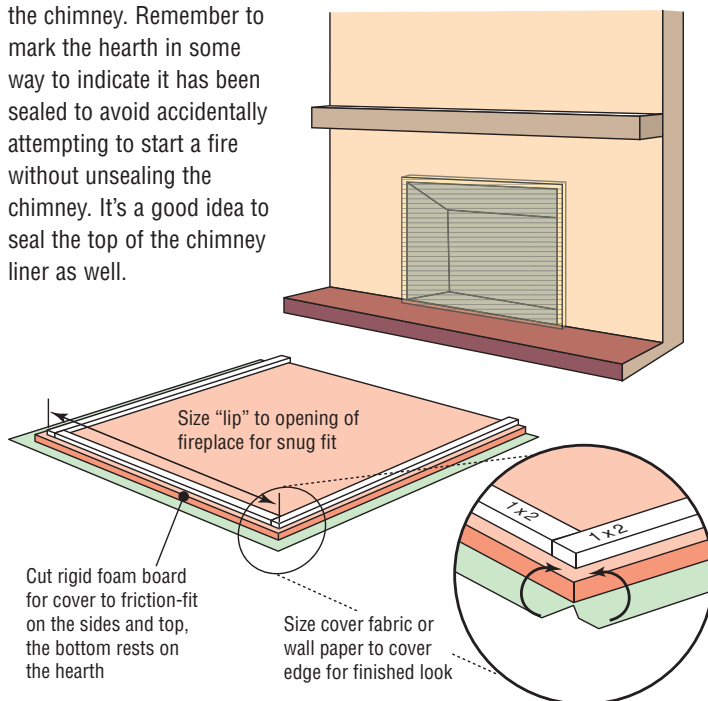
The performance of traditional masonry fireplaces has been improved through the centuries but efficiency is usually less than 15%. Modern catalytic wood-burning stoves and furnaces can reach efficiencies of up to 80%, which means a lot more heat (and a lot less pollution) per pound of fuel.

### Safe and efficient wood usage

- » Split into pieces 6 inches in diameter or smaller
- » Stack in a neat pile elevated from the ground
- » Cover top to keep dry
- » Store for at least 6 months to dry (season)

## Have a Fireplace That is Not Being Used?

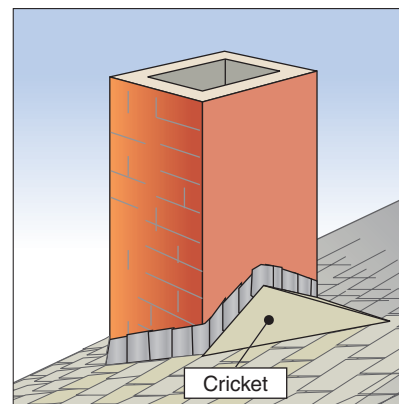
Closing the damper reduces room air escaping up the chimney to a degree but it is best to tightly seal the chimney. Use any rigid material such as insulation board and caulk to create a semi-permanent seal over the chimney opening. Another option is to use a specially designed product such as an inflatable air-pillow to seal the chimney. Remember to mark the hearth in some way to indicate it has been sealed to avoid accidentally attempting to start a fire without unsealing the chimney. It's a good idea to seal the top of the chimney liner as well.



*A friction-fit fireplace cover can be fabricated out of rigid foam board, 1x2 lumber, glue and a covering that can be fabric or a material to suit the decor.*

## Roof-chimney Details

If the home's roof is going to be replaced, give careful consideration to any chimney flashing details. Especially for chimneys that are low in the roofline, such as for fireplaces located on exterior walls, consider installing a cricket to better shed roof water away from the chimney. If the fireplace has been permanently sealed, can no longer be used, and local codes allow, consider having the chimney removed to below the roofline to avoid any future problems with roof leaks around the roof-chimney connection.



*A cricket helps divert roof runoff away from the chimney*