



Heating your home safely with wood

FACT SHEET



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As home heating costs rise, many homeowners are looking for supplemental sources of heat. Wood can be less expensive than traditional fuels (propane, oil, natural gas, electricity), making it a popular choice for many people. Wood fires are cozy and produce comfortable, radiant heat. Fireplaces, stoves, and fireplace inserts are attractive as well as functional. Wood can also serve as a reliable back-up source during winter power outages and fuel-supply disruptions.

In this fact sheet, we will look at the most popular ways to heat your home with wood—wood-burning fireplaces, wood fireplace inserts, and woodstoves—and examine the benefits and safety considerations of each.

FIREPLACES

Wood-burning fireplaces are the most popular type of fireplace because they can be inexpensive to use, if used properly. But did you know that these fireplaces can also be the least energy-efficient and most dangerous of your wood-burning options?

Before you put another log on the fire, take a moment to learn some simple science.

Are you actually losing heat?

Open-hearth wood-burning fireplaces may appear to generate heat, but in fact, most of the heat they produce goes up in smoke—literally. When a fire is burning, heat from the fireplace and from your home escapes up through the chimney. The heated air is replaced by colder air from outside, which may result in a net energy loss in your home.

Here's why. Wood fires need oxygen—lots of it. When a fire is blazing, large amounts of heated household air are drawn in through the fireplace and up the chimney. A conventional wood fireplace will use up to 10 times the amount of air required by a typical oil or gas furnace. Only a small fraction of the air drawn into the fireplace is actually used for combustion; the rest, known as excess or “tramp” air, is also drawn up the chimney.

This flow of “tramp” air has two consequences. First, it draws heat that is generated by the fire itself up the



Many people enjoy the cozy warmth of a wood-burning fireplace without realizing the dangers they pose.

chimney, rather than transferring it to the house. Second, it results in a high rate of air exchange in the house, which causes the furnace or other heat source to work overtime to heat more air. A roaring fireplace can exhaust all the air in a house up the chimney as many as 1.4 times for each hour the fireplace is used.

The ironic truth is: the colder the outside temperature, the more likely it is that your fireplace is taking more heat out of your home than it is producing.

A burning danger

Some homeowners, aware of the fireplace's inefficiency, will close the damper slightly to send more heat into the home and less up the chimney. But this only creates another problem—a potentially deadly one.

Smoke from burning wood contains, among other things, carbon monoxide—a deadly gas that you can't see, taste, or smell. A fireplace that backdrafts puts the home's occupants at risk of carbon monoxide poisoning. This is especially dangerous as the fire dies down and there is less heat available to draw the smoke up the chimney.

Another danger is the risk of fire. The more you use a wood-burning fireplace, the greater the risk to your home. Fires can occur in two primary ways: igniting creosote in the chimney and excessive heat transferring to objects near the fireplace.

Creosote is the dense, black, ashy substance that builds up on chimney walls when smoke and particles are released from burning wood. The creosote can



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The power is within you.



A direct-vent fireplace can add as much charm to a room as a wood-burning system, and your family will have the peace of mind that it is safer and more energy efficient.

ignite, causing a chimney fire. It is for this reason that you should enlist a professional chimney sweep at least once a year (twice annually in very cold climates) to safely remove the creosote buildup from the chimney walls.

Heat transference occurs when flammable objects are placed too close to a hot fireplace. The excessive heat can cause these objects to ignite.

If you use a wood-burning fireplace, follow these important safety guidelines:

- Have your chimney cleaned by a professional chimney sweep at least once a year.
- Install carbon monoxide detectors, test them regularly, and change batteries often.
- Keep all objects at least three feet away from the hearth to minimize heat transference.
- Weatherize and insulate your home for greater comfort and efficiency.
- Never leave a fire burning in your fireplace unattended.
- Make sure a wood fire is completely out before closing the flue.
- Never use your fireplace to burn paper or garbage.
- Burn only clean, dried, and seasoned wood. Hardwoods burn the cleanest, but all wood should be dried for a minimum of six months.
- Use a screen on the top of your chimney to prevent birds and other small animals from nesting in your chimney. The screen will also help contain sparks that could ignite the roof.
- Never use flammable liquids such as gasoline, kerosene, or lighter fluid to start or maintain a fire.
- When building a wood fire, place the logs at the back of the fireplace box on a grate.
- Always keep a fire extinguisher nearby in an accessible place.

Save heat and energy with a direct-vent fireplace

According to a study by the U.S. Department of Energy, a wood-burning fireplace can remove up to 24,000 cubic feet of air from a home in less than an hour. You can avoid this heat loss by installing a sealed-combustion, direct-vent fireplace that operates without the help of household air.

These highly efficient, low-maintenance fireplaces have a sealed glass panel that allows heat to pass through and radiate into the room. Consider replacing your open-hearth unit with a sealed combustion chamber, and enjoy up to 90-percent efficiency from your wood-burning fireplace.

WOODSTOVES

Since 1990, when the U.S. Environmental Protection Agency issued standards for woodstoves, heating with wood has become cleaner, safer, and more efficient. Properly used, today's wood-burning stoves are a controllable, reliable, efficient, and economical way to heat your home.

One of the biggest challenges with burning wood is how to burn all the gases that the wood releases. In addition to containing more than 50 percent of the wood's available energy, these gases are dangerous if left unburned because they contribute to both pollution and the build-up of flammable creosote in your chimney. These gases only burn at temperatures in excess of 1,100 degrees Fahrenheit—a difficult temperature to achieve in unaided wood fires.

Three types of woodstoves are available today that allow you to maintain a hot, efficient fire that burns escaping gases: catalytic stoves; high-tech, non-catalytic stoves; and pellet stoves.

Catalytic stoves

These stoves burn wood gases by employing a catalytic combustor—similar to those found in cars—to reduce pollution. The design of the combustor reduces the temperature required to burn gases to 600 degrees. As smoke passes through the combustor, the gases are burned, providing complete combustion and reducing air pollution.

High-tech, non-catalytic stoves

Non-catalytic stoves burn the gases by maintaining a hot fire in a heavily insulated firebox with a secondary

combustion chamber hot enough to burn gases. These non-catalytic (or “recirculating”) stoves require less maintenance but more attention because the smaller, hotter fires need to be replenished more frequently.

Catalytic and non-catalytic stoves are available as freestanding units, fireplace inserts, and fireplaces.

Pellet stoves

These highly efficient stoves burn densified wood pellets and have controlled air-to-fuel ratios that burn escaping gases. Attractive and practical, some stoves are designed to fit directly into your fireplace. A single freestanding stove can heat a small house, while a larger house might require a wood-pellet furnace. There is very little creosote buildup, drastically reducing the chance of chimney fires and the frequency of cleanings. Built-in shields prevent accidental burns and allow stoves to be placed near walls.

Wood-pellet fuel is purchased in 40-pound bags from local hardware and specialty stores and requires loading only once a day, depending on the day in the heating season. The fuel is fed into the fire automatically by an auger and can be controlled by a thermostat. Pellet stoves are available as freestanding units, fireplace inserts, and furnaces.

FIREPLACE INSERTS

Fireplace inserts are similar in function and performance to free-standing wood stoves, but are designed to be installed within the firebox of an existing masonry or metal fireplace. A certified installer will make sure the flue liner in your masonry chimney is installed correctly. If your fireplace is factory built (or “zero-clearance”), you must use an insert that was specifically designed and tested for your unit to make it more efficient and less polluting.

Woodstove and fireplace insert considerations

It is important to realize that burning wood requires a system, not just a stove or fireplace insert. Systems include the stove or insert as well as stovepipe, chimney, floor protection, proper clearance, and a host of other components. Like all systems, they require care and maintenance. While well-designed stoves greatly improve the efficiency and safety of burning wood, woodstove users must understand the proper methods of starting and maintaining a fire and caring for their stove and chimney.



With today’s efficient stoves, wood can be more economical than propane for heating a home.

Before purchasing a wood-burning stove or insert, also consider the following:

- Wood-burning systems must be properly installed, used, and maintained to avoid a fire hazard. Have your system installed by a professional, or carefully follow the manufacturer’s directions and code requirements. Consult a chimney sweep for regular cleaning.
- Wood takes up space for storage and must be kept dry. Use only well-dried and seasoned wood. If the wood you purchase is freshly cut, store it for at least six months to dry.
- Check with your insurance agent before making a purchase. Some insurance companies won’t insure homes with wood-burning stoves.

FOR MORE INFORMATION

Focus on Energy

Your one-stop shop for energy-saving tips and information.

focusonenergy.com

Hearth, Patio, and Barbecue Association

Learn more about fireplaces, stoves, inserts, and other fireplace appliances.

hpba.org/consumers/hearth

The Chimney Safety Institute of America (CSIA)

This nonprofit, educational organization is dedicated to chimney and venting system safety.

csia.org

Hearth.com

Find a glossary of fireplace terms and definitions.

hearth.com/what/glossary.html

Pellet Fuels Institute

This nonprofit educates consumers about the convenience and practicality of using wood-pellet fuel.

pelletheat.org

U.S. Environmental Protection Agency

Learn more about the several types of wood-burning appliances that people use to heat their home—either as a primary source of heat, as supplemental heat, or for ambiance.

epa.gov/burnwise/appliances.html#fireplaces

Natural Resources Canada

Learn all about wood fireplaces.

oee.mcan.gc.ca/publications