



# WOOD HEAT THE SAFE WAY

**A general guide to the safe and efficient installation  
and operation of wood heating appliances.**

Prepared by Farm Bureau Insurance in collaboration  
with Lansing Community College's Fire Science Program.



## TAKE EXTRA CARE

Years ago, when wood heating was more the norm than the exception, people were usually accustomed to working with it. The extra time and safety precautions that are necessary to make it safe were just a natural part of the heating process. Even then, however, fires were all too common.

People today are accustomed to the ease and convenience of modern heating appliances. A professional heating contractor installs the furnace, maintains it, and repairs it. More often than not, the homeowner's only connection with the device is the thermostat on the wall.

Heating with wood requires extra care on your part. We recommend that you research any expert information that is available and pay attention to manufacturer's installation guidelines and building codes. The more you can do to follow fire prevention guidelines and building codes, the safer you and your family will be. We have provided an overview of information we believe will be helpful and worthwhile for your review.

## Which Stove Is Best?

Many models are available. It's up to you to determine which will best fit your particular needs. The two most common materials used in the manufacturing of stoves are plate steel and cast iron. Wood stoves that do not have a label indicating that they have been tested and approved by Underwriters Laboratories (UL), or tested to UL standards, are usually not acceptable for insurance purposes.

Installation of these solid fuel-burning appliances should comply with the general manufacturer's installation instructions and current editions of Michigan Residential Code, Section M1905, and National Fire Protection Association (NFPA) 211, Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances.

If you have any questions about a solid fuel-burning appliance or its installation process, ask your local or state building inspector.

### Plate Steel

- Usually 1/8 inch to 3/4 inch thick.
- Requires special attention for good draft control.

### Cast Iron

- Often lasts a lifetime.
- Holds up well under extreme heat.
- Heats up slowly; retains and radiates heat for a long time.
- Will crack if dropped.
- Should be inspected for damage.

## UL Testing

1. Manufacturers submit products to UL for testing and safety certification on a voluntary basis.
2. In the United States there are many municipalities that have laws, codes or regulations which require a product to be tested by a nationally recognized testing laboratory before it can be sold in their area.
3. Many companies make it their policy to obtain UL Listing not only to minimize the possibility of local non-acceptance, but also as a matter of corporate policy and commitment to minimize the possibility of risk in the use of their products.





## Find a Good Place

Your stove should be placed in a central area with at least 512 cubic feet of space and allow for circulation of heated air. It should be located in a place where it can be supervised during operation and away from any unprotected walls, flooring, ceiling, or furniture. Stoves should never be placed in an attached garage or any other structure where gas-powered equipment is stored.

## Be Prepared

No matter how carefully you install your stove or what kinds of precautions you take, there is always the possibility that something could go wrong. That's why you should have:

- A UL listed fire extinguisher placed in the vicinity of (but not right next to) your stove.
- A smoke or smoke/fire detector placed in each bedroom, but far enough away from the stove to keep the detector from sounding off in the presence of normal heat radiation or intermittent smoke that may be given off during start-up or refueling.
- Portable folding escape ladders placed under beds or window sills in bedrooms for emergency use.
- An emergency exit plan for your home.

Prior to using any alternative heating devices, it's recommended that you install carbon monoxide detectors in several parts of your house.

## The Chimney

The two types of acceptable chimneys are masonry chimney with an approved clay liner or an UL listed prefabricated type. Do not use an emergency stove pipe chimney. When you purchase a chimney, be sure the merchant or contractor is knowledgeable, willing to give detailed information and able to warranty the product.

It must be installed according to manufacturer's installation instructions and clearances and current editions of Michigan Residential Code, Section M1905, and NFPA 211, Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances.

### Prefabricated Chimney

- Constructed more easily than other types.
- Must be listed by UL and must comply with ANSI/UL 103 standards or comparable test.
- Must be rated as solid-fuel or all-fuel chimney.
- Must have stainless steel outer casting, one inch of insulation, and stainless steel inner lining.
- Heats up rapidly inside and stays warm to prevent creosote buildup.
- Should be inspected for thin spots annually and must be inspected after any chimney fire.

### Masonry Chimney

- Usually costs less for materials, but labor is costly.
- Lessens the danger of a burn-through fire inside the chimney.

**Note:** Over 80% of all fire-related deaths occur in residential properties, and smoke inhalation causes more deaths in home fires than burns do.

**Note:** One spark can set a creosote-filled chimney on fire. Never burn paper or other household waste in your wood stove. Keep your chimney as clean and free of obstruction as possible.

- Should be large enough to provide adequate draft. Cross-sectional area of the chimney flue should be at least 25 percent greater than that of the connecting stovepipe.
- Must have a tile liner or approved prefabricated chimney as liner.
- Can be constructed of brick, cement block, or stone.
- Must be constructed with proper clearances from walls, floors, roofs, ceilings, and other combustible material.

### Existing Masonry Chimney

- Should be inspected thoroughly and cleaned before use.
- Requires the services of a mason for needed repairs and safety measures.
- If not already lined, should be lined with a prefabricated chimney or clay flue tiles.
- When installing a fireplace insert into the existing fireplace, a prefabricated chimney attached to the insert and running to the top of the existing chimney must also be installed in the existing fireplace chimney.

***Chimneys that service wood heating stoves should be professionally inspected and cleaned to prevent chimney fires.***

***If you have any questions, seek out your local or state building inspector.***

## Chimney Installation

A chimney has two basic purposes: to create draft and to evacuate the gases of combustion. Both are very important to the safe operation of your stove, so you must follow certain guidelines.

- Comply with manufacturer's installation instructions and the current editions of Michigan Residential Code, Section M1905, and NFPA 211, Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances.
- If you have any questions about the installation of your solid fuel-burning appliance, chimney, stovepipe connector, or flue, ask your local or state building inspector.
- Your chimney, whether prefabricated or masonry, should extend at least three feet above a flat roof or two feet above any ridge within ten feet. There should also be at least 16 feet between the stove outlet and the top of the chimney.
- Never vent more than one heating appliance into one flue. Otherwise, incomplete combustion of gas or oil might result in explosion or fire if ignited by sparks from the wood stove. Fumes – including carbon monoxide – and sparks could also enter the room through either unit.



## Clearances

Always follow the stove manufacturer's installation instructions and the current editions of the Michigan Residential Code, Section M1905, and NFPA 211.

### Walls and Floors

- A radiating stove should be at least 36 inches from any unprotected surfaces, including walls, floors, and furniture.
- Clearances for circulating stoves should follow manufacturer's recommendations.
- A two-inch layer of sand or ash should be maintained in the bottom of the firebox.
- The stove legs should be at least six inches long. If they aren't, the stove should sit on a protected surface of bricks to maintain the air space between the protected floor and the stove.

### Wall Protection

- Metal-covered combination board, brick, stone, or other masonry material should be installed.
- One-inch fireproof spacers should be installed between the wall and the protective surface so that air can circulate freely behind.

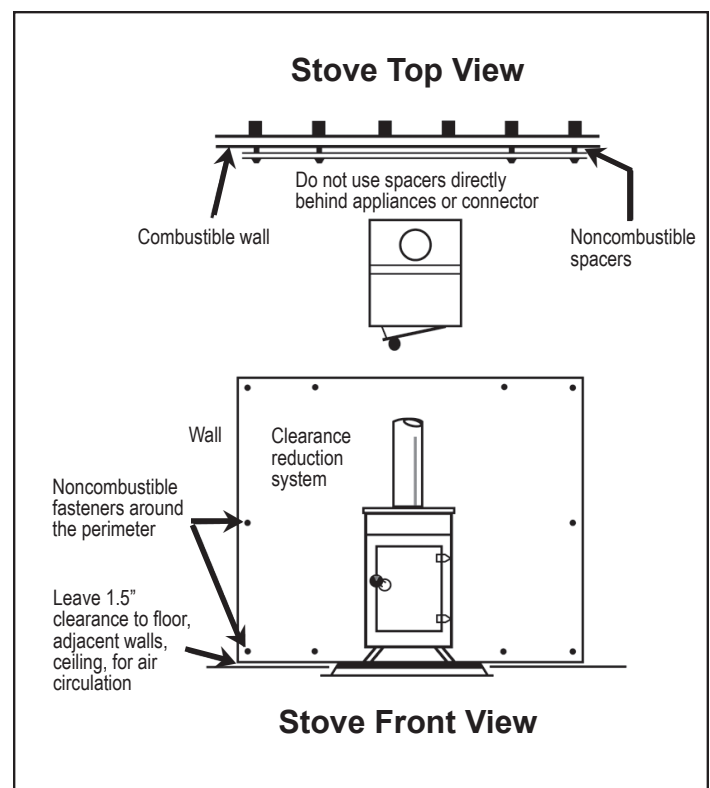
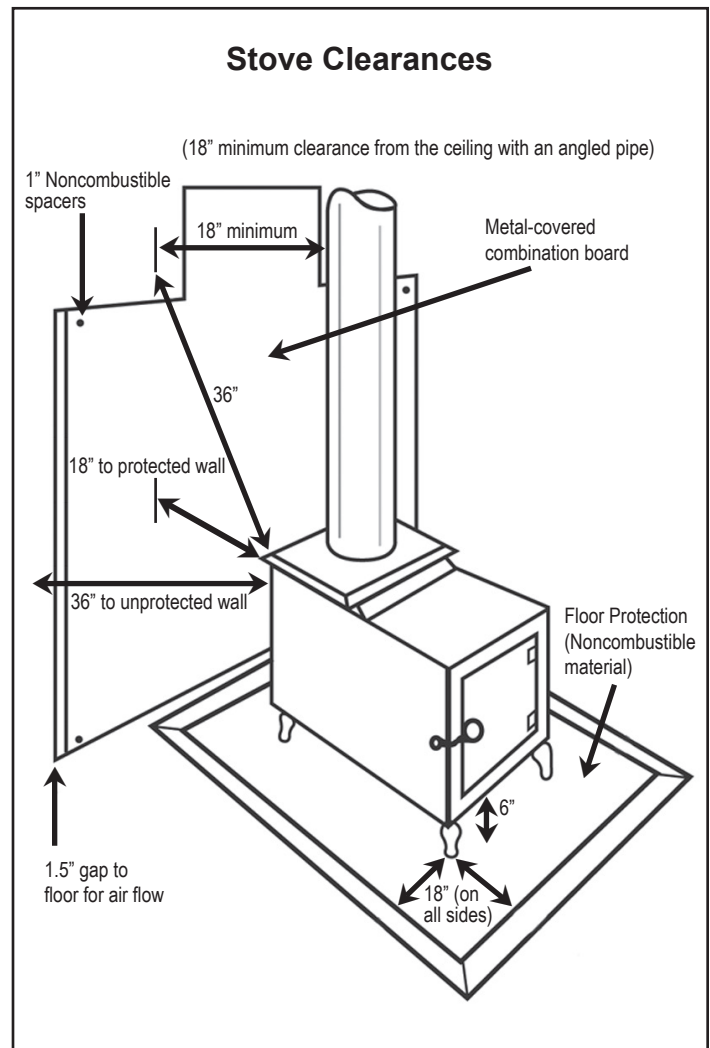
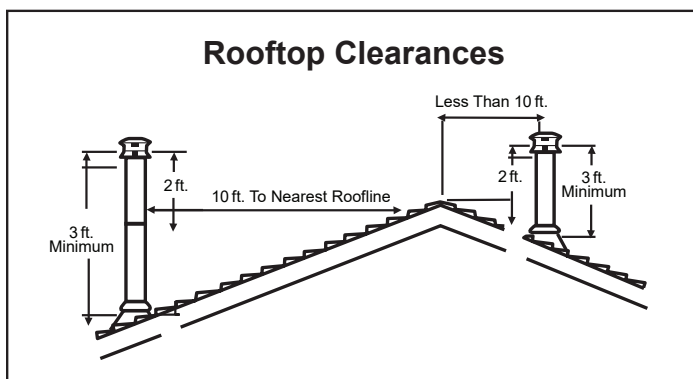
### Floor Protection

All floors must be protected unless appliance has been tested and listed for non-protected flooring. If not:

- Use metal-covered combination board, slate, brick, or marble.
- Extend the floor protection 18 inches beyond the stove on all four sides. If the manufacturer's recommendations are less than 18 inches, contact your Farm Bureau Insurance agent for more information.

### Roof Protection

- Metal Flues must be a minimum of 3 feet tall and 2 feet higher than any part of the roof within a 10-foot radius of the flue.





## The Stovepipe Connector

The pipe connecting your stove to your chimney is often little more than three feet long, but it plays a vital role in the safe operation of your wood stove. Remember:

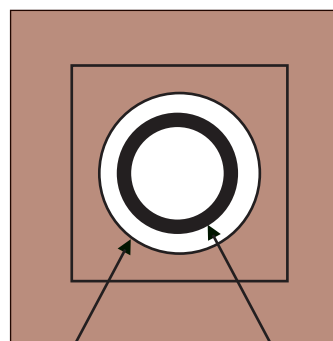
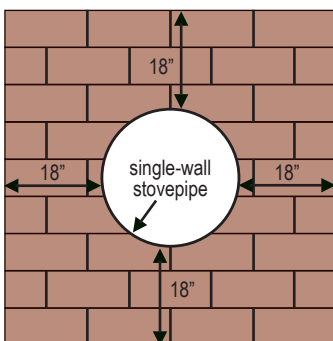
- Keep the connector as short as possible.
- Each joint (if you're using more than one section) should be fastened securely with at least three sheet metal screws.
- If the pipe is more than six feet long, it requires other mechanical support for the weight.
- If a masonry chimney is used, the stovepipe should extend to the inner surface of the masonry wall, but not into the flue space itself.
- Clearance between the connector and any combustible materials, including walls, floors, and ceiling, should be at least 18 inches.
- If more than one section is used, the upper pipe should be fitted over the lower pipe to prevent air leaks.
- Try to avoid 90-degree angles in the stovepipe construction; instead, use 45-degree angles.
- Do not reduce the size of the stovepipe from the outlet to the chimney. Otherwise you might get backup smoke.
- Only two bends are allowed for any stove pipe connections.
- If the stove is not equipped with a damper, one should be built into the stovepipe connector to control draft and allow for the release of volatile gases.
- If a stovepipe connector must pass through a wall, there should be no combustible materials within 18 inches of the pipe. The clearance area should be filled with brick or masonry, which can then be covered with metal.

- You may reduce the required clearance from 18 inches to 2 inches by installing a section of double-wall insulated pipe through the wall.
- Heat Reclaimers (sometimes referred to as Heat Exchangers) are not acceptable as they contribute to creosote buildup.



## Firing and Stoking the Stove

- When you start a fire for the first time, place larger logs on top of kindling.
- Never use gasoline, kerosene, charcoal starter, oil, or any other flammable liquid to start a fire. Flash fires or explosion could result, and fumes from these liquids are extremely dangerous.
- Realize that it may take several tries to establish a fire in your stove, depending on your methods and materials. Take the time you need to start a proper fire with proper fuel.
- When you start your fire, open the draft control or damper wide. This will make the fire catch quickly and will allow less backup smoke into the room. Soon after the fire catches, the controls should be adjusted down again.
- Before you stoke the fire, open the draft control or damper for a minute or two before you open the stove to prevent a lot of smoke from entering the room. Again, remember to adjust the controls down soon after.
- If your home is tightly insulated, you might want to crack a window to ensure a proper draft, or install an outside air supply for your wood stove, for safe and efficient operation.



2" clearance to combustibles

Double-wall insulated pipe

## Problems

### Creosote

Creosote is generally a sticky, tar-like substance that accumulates in your chimney as a result of incomplete combustion. Over time, it can crystallize on the surfaces of your chimney and pipes. When controlled properly, creosote is a minor inconvenience that you can easily clean out. But when it accumulates, creosote becomes dangerous – and one spark can turn your chimney into an inferno. You can't avoid creosote, but you can control it by following a few guidelines and inspecting and cleaning your chimney regularly (at least once per heating season or more depending on usage).

- When installing your stovepipe connector, use the tap test. Tap the pipe with your fingernail and remember the sound it makes. Repeat the procedure every week during your first season of operation and monthly thereafter. If the clink sound turns into a thud, you'll know it's time for a further inspection.
- It's important to use dry well-seasoned hardwoods for burning and to use short, hot fires during milder weather rather than long, smoldering ones.
- It's a good idea to stoke up a fire once a day to make it burn hotter for a short period. This will warm the chimney and help reduce creosote buildup.
- Creosote tends to build up more quickly with newer, airtight stoves because less air escapes into the chimney. Regular inspections and frequent cleaning are important.
- Try to avoid sags or sharp turns in the stovepipe connector. They tend to accumulate more creosote.

### Backup Smoke

This is an irritating and potentially hazardous problem. When the stove is being loaded, a little smoke is natural and can usually be avoided if you open the damper and draft controls briefly before opening the stove. But a lot of smoke means that something is wrong – such as:

- You have more than one heating unit operating on one flue.
- Your house is located in a forest clearing and may require a taller chimney cap to avoid downdrafts from the treetops.
- A hill or large building is nearby.
- The chimney is blocked by birds' nests, creosote, fallen masonry, or some other obstruction.

- The chimney is not tall enough.
- The stove outlet is less than 16 feet from the chimney top.

Backup smoke can let dangerous gases, including carbon monoxide, into your home. If you can't readily solve the problem, contact an expert immediately.

### Chimney Fire

- Call 911 or the fire department at once.
- Close off the oxygen supply (if your stove is an airtight model).
- Use a UL listed multipurpose fire extinguisher.
- If the fire is not extinguished, evacuate the building.
- The chimney must be inspected by a qualified chimney sweep after a chimney fire.

### Appliance Cleaning

- Empty all ashes into a metal container, douse with water and dispose of appropriately.
- Do not remove or handle hot ashes or debris from the appliance.
- Do not use any plastic utensils or containers, including shop vacs, for warm or hot ashes or debris.





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This pamphlet is not intended to substitute for the recommendations of a licensed heating and cooling contractor who makes specific recommendations for a particular installation in accord with experience and the recommendations and instructions provided by manufactures of wood and solid fuel heating appliances. This is a general guide and is intended solely as an introduction to general practices for installation and operation of such appliances.