

# wood stove and fireplace safety and maintenance

CLICK ANYWHERE on THIS PAGE to RETURN to  
WOODSTOVE & FIREPLACE INFORMATION at  
[InspectApedia.com](http://InspectApedia.com)



Cooperative Extension Service  
South Dakota State University  
U.S. Department of Agriculture



# wood stove and fireplace safety and maintenance

By: **Larry Helwig**, Extension Forester,  
and **Mary Ann Sward**,  
Extension Housing Specialist

Not many homes have burned down because of faulty wood stoves or fireplaces in the last 25 years, but neither has there been an interest in burning wood as an alternative fuel source. However, sales in woodburning stoves and fireplaces have been booming in the last several years, and safety in the home and while procuring wood must again be considered.

Fires from stoves occur when stoves are improperly installed or operated. Specific clearances are needed for fireplaces and stoves between floors and walls as shown in Figure 1 and Table 1. A sheet of 1/4" asbestos millboard with 1" noncombustible spacers behind it provide good wall protection. Brick or stone provide little or no protection. Floor protection should not be ignored. A metal square with asbestos backing can keep hot coals from starting a fire on the floor.

## The Chimney

The chimney's main purpose is to create a draft that carries unburned gases to the outside. Older chimneys may have been purpose-

ly plugged. Check an older fireplace chimney before venting a stove into it. Mortar the joints where needed.\* **Never vent a wood stove or fireplace to a chimney used for a gas or oil unit**, because a wood fire burns much hotter than the on-again-off-again gas or oil unit.

New chimneys are of two types, the masonry kind with an earthen flue liner or the prefabricated kind. There are two types of prefabricated chimneys. One has a stainless steel inner and outer jacket with an inch of insulation between the jackets; the second type has a triple wall for insulation. Install a chimney that is UL labeled as an ALL FUEL chimney. Check with local fire codes and your homeowners insurance policy for further specifications.

A chimney located in the interior part of the house will maintain a higher temperature, which will aid in producing a better draft than a chimney located on the outside. It will also heat up

more efficiently and not build up with creosote so quickly. If two stoves or a stove and a fireplace are connected to the same chimney, despite recommendations not to do so, the flue connector pipes should enter at different elevations.

The outside **height** of a chimney should extend at least three feet above flat roofs (See Figure 2.) or at least two feet higher than any point ten feet away on pitched roofs. The **flue lining** (see Figure 3) should extend 4 inches above the masonry and should be cemented with a sloping finish to drain water away. Approved **metal caps** will minimize downdrafts and are easy to install. The cap should contain enough open area to equal the "chimney outlet area" and still not allow downdrafts and rain to be a problem.

The stove pipe or vent should be large enough not to interfere with good combustion efficiency and proper draft. Stove pipes usually come in 2 foot lengths, are 6 to 8 inches in diameter and are made of 24 gauge or thicker metal. The damper, if there is one, should be located near (about 2 feet above) the stove so the volatiles will be burned before cooling. Avoid long, horizontal runs. Use 45° angles to create an upward slope in the flue connector pipe (see Figure 4) When passing through a wall, provide an opening with at least 6" of clearance from all wood framing and protect it with a "double wall ventilated thimble". (see Figure 5).

Creosote is the result of unburned gases condensing on cool

\*The National Fire Protection Association Standards state a chimney should not serve both a fireplace and a stove.

**Table 1. Minimum Clearances from Combustible Walls and Ceilings**

Type of Protection	Stove Type		Stove Pipe
	Radiant	Circulating	
None	36"	12"	18"
1/4" Asbestos Millboard, spaced out 1"	18"	6"	12"
28 gage sheet metal, spaced out 1"	12"	4"	9"
28 gage sheet metal on 1/8"asbestos millboard, spaced out 1"	12"	4"	9"



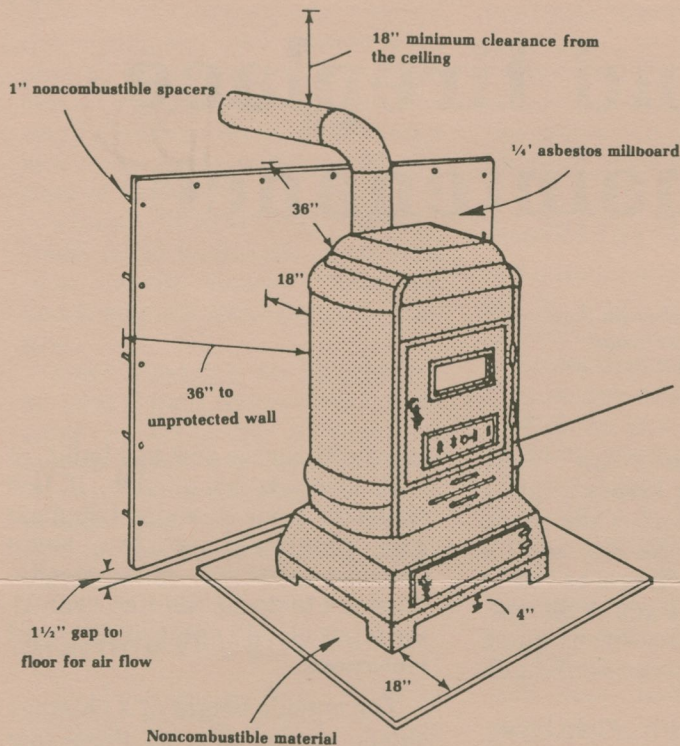


Figure 1. Recommended clearances for safe stove installation.

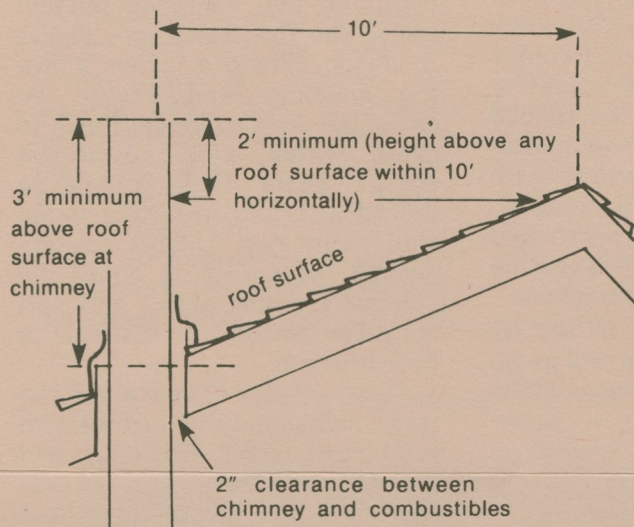


Figure 2. To prevent downdrafts and fire from sparks, chimney height must be at least 2 feet above any roof surface with 10 feet horizontally.

surfaces. Creosote can be found anywhere in a wood heating system and can clog or restrict air flow in vent pipes and chimneys. (See Figure 6.) It is dark brown or black and has a very unpleasant acrid odor. The rapidity with which it builds up depends upon the wood being burned—slow burning or moisture-laden wood

and pine and spruce are the worst. Hot burning or more complete combustion burning stoves exhibit fewer creosote problems. Chimneys and vents that are able to maintain high temperatures also have less problems.

**Chimney fires** usually start from creosote or soot build-up. Check for the amount of build-up

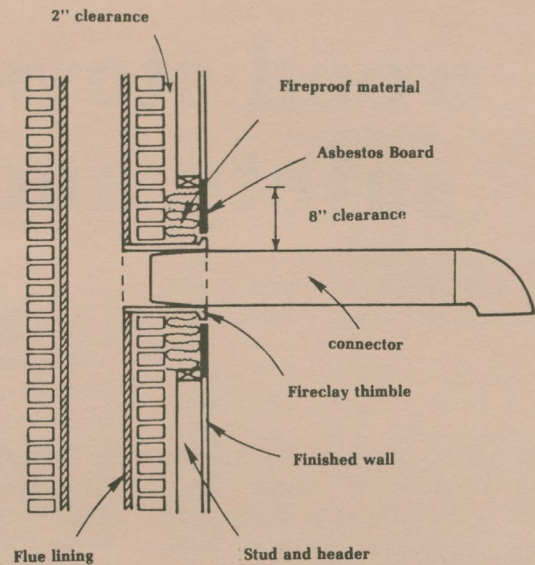


Figure 3. Diagram of correct chimney connection.

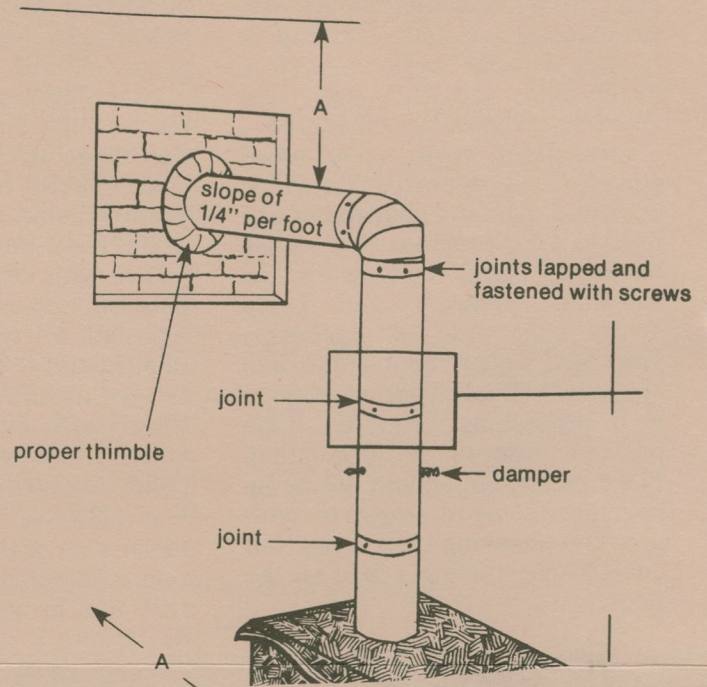
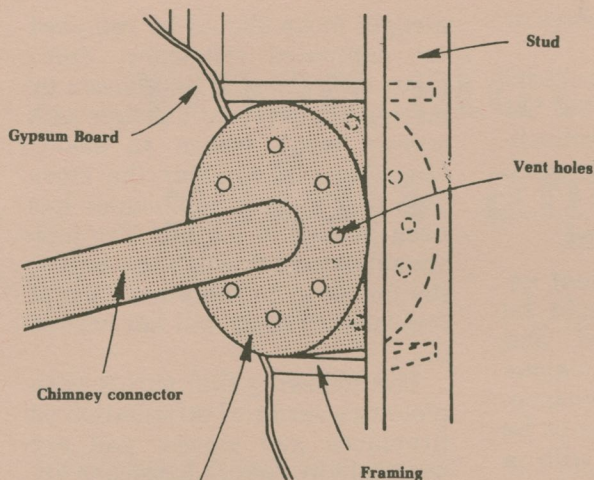


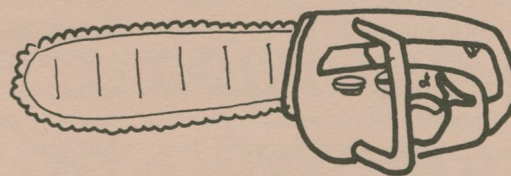
Figure 4. Safe installation of chimney.

by tapping the stove smoke vent with a finger. A sharp "ting" means very little build-up, while a muffled "thud" could mean a substantial amount. Chimney fires usually start when hot roaring fires send flames up the chimney and ignite the creosote and soot. Burning light, easy-to-burn materials can also cause chimney fires.





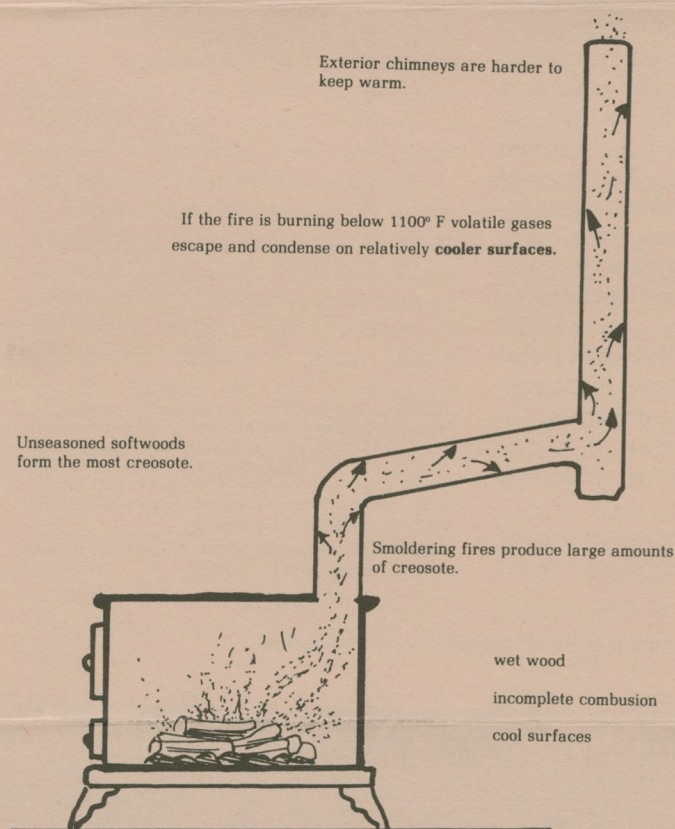
**Figure 5.** A ventilated thimble permits the stove pipe to pass safely through a combustible wall. The thimble diameter should be three times the diameter of the stove pipe.



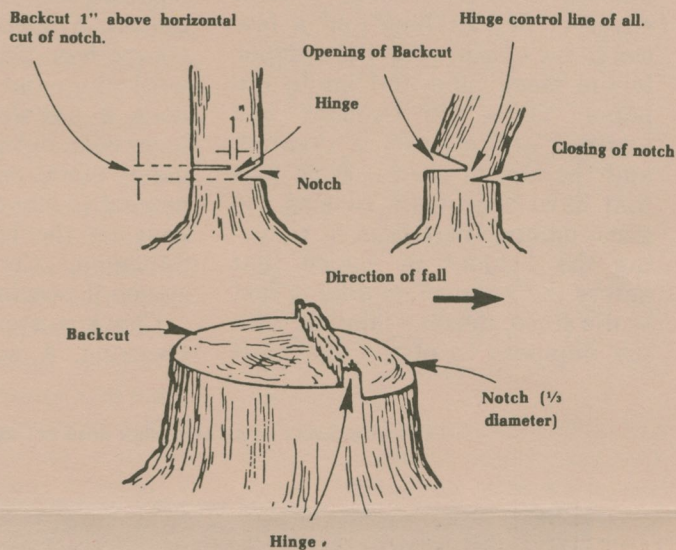
**Figure 7.** Know the hazards of chain saw operation—loss of footing, kickback, noise, vibration, wind, carelessness, fatigue or fire.



**Figure 8.** Kickback is a common cause of chainsaw injury to an operator. Hitting an object with the nose of the moving chain will throw hundreds of rapidly moving blades at you. Do not operate your saw beyond your capacity of experience. Ask your chainsaw dealer for the safety rules published by the Chain Saw Manufacturers Association.



**Figure 6.** Causes of creosote formation.



**Figure 9.** Correct way to fell a tree. Produce a well-balanced hinge to correctly fell a tree. Like hinges on a door, it will guide the direction of fall. Retreat at a 45 degree angle from the line of fall. Make sure that the area is clear of any obstructions before proceeding to saw.

If a chimney fire should start, call the fire department first and then close all the dampers. While waiting for the fire fighters, the National Fire Prevention Association recommends controlling a chimney fire by dumping large amounts of rock salt or baking soda in the fire chamber of the stove or fireplace. **Do not use water.** It could cause a steam ex-

plosion or crack the fire box or flue liner.

## The Chainsaw

If significant amounts of wood are to be used, the purchase of a chainsaw might be considered. A chainsaw can be very dangerous if the operator is not alert and familiar with its operation. Do not

be in a hurry when operating it, and use it during good weather conditions. Remember, the fast moving chain on even the smallest of saws can be lethal. Do not go out alone. Take along another adult. (See Figure 7.)

**Kickback** is the major unpredictable chainsaw hazard. Kickback occurs when the chain near the nose end of the cutting bar cat-



ches an obstruction, which sends the cutting end back toward some part of the operator's body. (See Figure 8.) Cutting off tree limbs or small diameter wood often causes kickback. **Avoid cutting with the nose of the saw.**

Wear close-fitting clothes, rough soled boots with steel toes, light non-slip gloves, a hard hat and knee pads while operating the saw.

Store wood in a dry location for as long a time as possible before using it. Wood cut at least six months before burning will create less creosote problems and will produce more heat for the room. **Do not use flammable liquids to start or rekindle a fire.**

## Starting the Fire

In building a fire, leave a shallow bed of ashes to help reflect the heat. Crumple a small amount of paper, cover it with slivered, dry kindling and a few small dry sticks, open the damper in the stove pipe and ignite the paper. Once the chimney has warmed and a draft is created, add the larger pieces. Burn logs that have been split. Closing the stove damper may help in reducing the amount of smoke that enters the room when adding fuel to the stove. Become familiar with the dampers to obtain the most

heat from the wood in the stove or fireplace.

Place the ashes in a metal container with a tight-fitting lid. Set the container on a noncombustible floor or outside on the ground.

## Maintain Equipment

Maintenance of equipment used in wood burning should be thought of as an annual, and sometimes monthly chore, depending on how much wood is burned. The chain saw should always be in good running order with a sharp chain.

Maintain a dry supply of good hard wood like oak. Wet wood causes increased maintenance of the wood burning equipment.

Don't allow the venting system to become faulty. The chimney and vent pipes should be inspected every fall and maintained in good condition. An annual cleaning will almost always be required. A burlap sack filled with coarse hay, tied to two ropes and worked up and down the chimney does a satisfactory job on the loose soot, but scraping with a flat metal blade on a long handle is needed to loosen the creosote. Go easy on the mortar so it is not damaged. Contact a chimney sweep if possible.

Check a stove for warping or cracking. A warped door on an

airtight stove should be replaced for continued efficiency. Stove pipes move around and loosen by jarring. Pipes joined together with screws won't loosen as easily. Check to see whether the stove pipe that enters the chimney has been pushed in too far. The pipe should extend through the wall at the chimney, to the inner face of the chimney liner, but not beyond it.

The following fact sheets complete this series of information on fireplaces and stoves, and are available at County Extension Offices.

FFS 721, Fireplaces, Stoves and Fuels—What are Your Choices  
FFS 722, Wood Burning Stoves  
FFS 723, Fireplaces

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the USDA, Hollis D. Hall, Director of Cooperative Extension Service, SDSU, Brookings. Educational programs and materials offered without regard to age, race, color, religion, sex, handicap or national origin. An Equal Opportunity Employer.

File: 18.3-14—10,000 printed at an estimated 6 cents each—10-79gly—4185A.

Use of product name or design does not imply endorsement of one product over another.

D. HANSON '79



wood stove  
and fireplace  
safety and  
maintenance

Cooperative Extension Service  
South Dakota State University  
U.S. Department of Agriculture