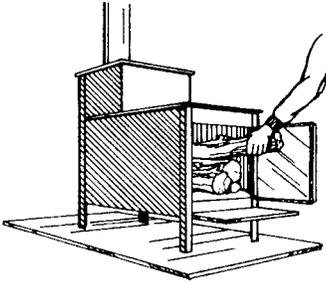


UI Extension Forestry Information Series

Safe Wood Stove Operation

Tom Karsky



Once you have selected and properly installed your wood stove, you must operate it safely to get the most efficiency and enjoyment without the danger of a house fire.

Starting a Fire. When building a stove fire, follow any specific recommendations made by the stove's manufacturer. The following steps can also serve as a guide:

1. Open the damper completely.
2. Place paper or kindling and small pieces of wood into the stove. Then light the paper or kindling.
3. Slowly add larger pieces of wood after the smallest wood is ignited.

Never use flammable liquids such as gasoline, lighting fluid, kerosene, etc. to start a fire. An explosion or uncontrollable fire may result. Paper is not recommended for starting fires in stoves with catalytic elements. The ashes will plug the holes in the honeycomb and make the unit inefficient.

After the fire is well established, adjust the draft controls to maintain the desired heat output. This setting will vary with outside wind velocity, atmospheric conditions, fuel type, stove size and condition and outside temperature. As you gain experience using your stove, it should become easier to make adjustments for your needs.

New stoves with cast-iron parts should be "seasoned" to avoid cracking. Do this by building only small fires for the first two or three times to allow the stove to heat up slowly. For stoves without an ash pit, insulate

the bottom of the firebox with 2 inches of sand. This will help prevent overheating of the stove's bottom and premature burnout.

Refueling a Hot Stove. When refueling, open the draft controls and wait a few minutes for the stovepipe and flue to heat up. This will increase the draft and should prevent smoke from coming out into the room when the stove door is opened. Add the wood and leave the draft open until the new wood has caught fire and is burning briskly. Once the new wood has caught fire, readjust the controls to the desired setting.

An Untended Stove Fire. Untended fires are common causes of wood stove related home fires. Whenever you must leave your house while a fire is burning, take the necessary precautions to prevent a possible house fire. The worst dangers in leaving a stove burning are that the fire will burn out of control and overheat the stove or that a spark from the fire will escape through a draft inlet. You can guard against both these possibilities by opening the stovepipe damper and closing the air inlet dampers. The stove fire will then go out.

If you have a nonairtight stove, check before leaving to be sure that the fire has died down. Since these stoves have their own hidden air intakes, they are much more difficult to control. A large fire burning unattended in such a stove is dangerous.

Also, be sure that you have left nothing combustible within 3 feet of the stove. It's easy to overlook such things as clothes drying, furniture, kindling, newspapers, or logs left to dry under the firebox. All these things can catch fire from intense heat radiation.

When you return, open the dampers. Stoke the fire and let it burn briskly for a while. Closing the air inlet

dampers on a stove increases creosote buildup. Letting the fire get hot again will burn off some of this creosote before it becomes a problem. If you are away from the house for long periods or on vacation, use conventional heating if possible. Many house fires have resulted because a neighbor tending the home forgot to check the wood stove.

Creosote Control. When wood burns, the combustion process is never complete. The smoke produced usually contains a substance called creosote, which is dark brown or black and has an unpleasant odor. When stovepipe or chimney flue temperatures drop below 250°F, creosote will condense on the surfaces. Creosote is very flammable. If a thick coating is allowed to form in your stovepipe or chimney, you run the risk of a damaging chimney fire should it ignite.

The best method for controlling creosote buildup is to maintain a hot fire. This will allow flue temperatures to remain above 250°F and prevent creosote condensation. However, few people would want to maintain such a fire in their stoves on a continual basis because it would deliver too much heat and burn too much wood. An alternative to help reduce creosote buildup is to open the dampers and deliberately have a hot fire for 15 to 30 minutes once or twice each day the stove is used. This “clean out” fire will burn off creosote in very small amounts, thus reducing buildup problems. Using “clean out” fires along with a regular chimney maintenance program (chimney cleaning and inspection) can prevent creosote problems.

Mild Weather or Reduced Heat Operation.

During the fall and spring months or during occasional warm spells in the winter, less heat is needed, and the stove is dampered down. For comfort, a wood stove too big for the heating area requires operation at a low temperature. This cooler fire results in inefficient burning and creosote formation. Chimney fires are very common the first day or two of a “cold snap” following a warm spell because the stoves are burned hotter, igniting the creosote formed in the chimney during mild weather.

When it becomes necessary to operate your stove at reduced heat, control creosote by building a “clean out” fire for 15 to 30 minutes as mentioned earlier.

Chimney Inspection. Regardless of the steps you take to reduce creosote buildup, inspect all stove pipes and flues regularly for any signs of creosote accumulation. Be especially attentive during the first wood burning season to assure proper stovepipe or chimney installation.

Tap on the pipe with a metal object to check it for creosote buildup. The sound will change from a metal ping to a dull thud as creosote builds up inside the pipe. Clean the stove at least once during the heating season to both increase efficiency and minimize the danger of fire. Inspect the chimney flue by lowering a lighted flashlight or protected electric bulb down it. A mirror can also be used, in some cases, to look up the chimney from inside the house. Ideally, you should inspect your chimney and stovepipe once a month during the heating season. If the inspection indicates significant creosote buildup, then the chimney should be cleaned.

The best method for eliminating creosote buildup in a chimney is to use chimney brushes. Chemical cleaners are not effective in cleaning away significant amounts for creosote buildup in a chimney. Such cleaners can, however, be used routinely to reduce creosote formation in new or clean chimneys.

Ash Removal. Ash disposal is not a major problem because the volume of ash produced is generally small – about 1 to 1 ½ bushels of ashes per standard cord of firewood. Under round-the-clock operation with normal heat output, most stoves will need to have ashes removed once every week to 10 days. Ash residue is extremely beneficial as a fertilizer and should be used as such whenever possible.

Ashes should be removed and placed in a noncombustible container and stored on a noncombustible floor or on the ground, well away from combustible materials until final disposal. Never shovel ashes from the stove into a paper bag, cardboard box, or plastic container as many home fires have started when hot embers ignite the combustible container in which they were placed.

Be Prepared for Chimney Fire. No wood burning system is 100 percent safe and fireproof. A safe

installation and extra care help prevent fire, but accept the idea that there could be a fire, and be prepared to handle it. Chimney fires are most likely to occur during a very hot fire, as when cardboard or Christmas tree branches are burned or even when a stove burns normal wood but at a higher than normal rate.

Make certain everyone in the house is familiar with the warning signs of a chimney fire – sucking sounds, a loud roar, and shaking pipes. Instruct everyone on what to do in case of fire. Practice fire drills and instruct all adults on how and when to use a fire extinguisher. Put the fire department phone number in an obvious place near the phone.

If you have a chimney fire:

- Call the fire department immediately.
- If all the stovepipe joints are tight and no other appliance is connected to the same flue, close all openings and draft controls if you have an airtight stove. Close the stovepipe damper in a nonairtight stove.
- If you have a leaky stove, you may have to wait for the fire to burn out.
- Get everyone out of the house, and put them to work watching for sparks or signs of fire on the roof or nearby. One adult should stay in the house to check the attic and upper floors for signs of fire.
- Discharge a class ABC dry chemical fire extinguisher or throw baking soda into the stove if the chimney is not sound or there is a danger of the house or surroundings catching on fire. The chemical travels up the chimney and often extinguishes the flame. Special fire extinguishers are also available for stove and chimney fires. They give off intense smoke and smother the fire.
- Throwing water in a stove will cause the metal to warp, but if it's a choice between the house or the stove, use water.
- Check the chimney after a fire. A chimney fire can range from 2,000°F to 3,000°F which is hot enough to cause deterioration of metal or cause masonry to weaken. Metal chimneys can deteriorate after 2 or 3 fires.
- If a chimney fire occurs once, chances are that it will occur again. Find the cause.

A problem with frequent chimney fires is the possibility of the house framing catching on fire. The ignition temperature of new house framing is about 500°F. Over a period of years, as this wood is repeatedly heated by chimney fires, the wood will ignite at a much lower temperature.

Fire Extinguishers and Detectors. You should install a multipurpose dry chemical extinguisher within easy reach of each stove. A 2-A, 40-BC extinguisher may be desirable. Using water on a hot stove in an emergency can result in severe stove damage or even an explosion.

For additional family protection, equip your home with smoke detectors. Locate the smoke detector in an adjacent room to avoid false alarms from smoke escaping from the stove either when you refill it or from backpuffing caused by the wind.

Special Safety Points.

- Because of high temperatures that can occur while the stove is operating, locate the stove out of traffic patterns and well away from furniture and draperies.
- Never allow young children to play without close supervision in the same room where a wood stove is operating.
- Alert children to the hazard of hot surface temperatures, and keep them away from the stove to avoid burns or clothing ignition. This is especially important with radiant-type stoves because of their normally hotter surface temperatures.
- Never place clothing or other flammable material (paper, kindling, furniture, etc.) within 3 feet of the stove.
- Always carefully instruct baby-sitters about the operation of your stove.
- The stove is designed to burn wood, not garbage. Some plastics can give off toxic fumes when burned.

This information first appeared as CIS 641 and was part of the *Wood as a Fuel Series*.

About the Author: *Tom Karsky* is a Extension Farm Safety Specialist and Professor at the University of Idaho.