

#7 Operating your appliance...safely

Do you know what a firing cycle is? Do you know how to manage your wood stove's firing cycle for maximum safety and efficiency? Has your appliance retailer explained how recent changes in wood appliance design affect the way you should build a fire? If your answer to any of these questions is "no", then this fact sheet is for you. It explains how to operate a wood-fired heating appliance to produce maximum heat and minimum creosote. Combining common sense with an understanding of basic scientific principles, you can make the most of your hard-earned firewood and ensure safe, trouble-free operation of your appliance.

Proper woodburning techniques will create high temperatures in and around your appliance, its flue pipe and the chimney. Check with a WETT certified professional to ensure that your woodburning system is properly installed and in good condition before using these methods. As long as it's in good shape, these techniques will not damage your appliance, but will keep it burning cleaner and operating better.

Wood is a "hydrocarbon" fuel, made up of carbon, hydrogen and Oxygen. When it is heated in the presence of oxygen, it decomposes, and its chemical constituents are rearranged. In the process, heat and light are given off.

UNDERSTANDING COMBUSTION

The first step in getting your appliance to work properly is to understand how and why wood burns. As wood burns, it goes through three phases:

➤ boiling off water in the wood. "Green" firewood is between 35% and 50% water. Properly seasoned wood is about 20% water. The more water in the wood, the more energy the fire will use boiling it instead of producing heat.

➤ the smoke or flame stage. As the wood heats up above the boiling point of water, it starts to smoke. The hydrocarbon gases and tars that make up the smoke are combustible if the temperature is high enough and oxygen is present. When the smoke burns, it produces bright flames. If it doesn't burn in the firebox, it may condense in the chimney, forming creosote. Your goal should be to achieve complete combustion of the smoke, which accounts for about half the total energy in firewood.

➤ the charcoal stage. Charcoal accounts for the other half of the energy in firewood. It is what is left after most of the hydrocarbons have burned off. Charcoal is almost 100% carbon, and burns with very little flame or smoke as long as there is enough oxygen.