

A CONCISE GUIDE TO HIGH-PERFORMANCE WOODBURNING

1. Understanding Combustion

As firewood burns, it goes through three phases:

Canadian wood-heat consultant and stove retailer **John Gulland** offers these tips for getting the cleanest, most efficient burn possible from conventional and new-technology updraft stoves.

Water

Up to half the weight of freshly cut logs is water. After proper seasoning only about 20% of the weight is water. As the wood is heated in the firebox, this water boils off, consuming heat energy in the process. The wetter the wood, the more heat energy is consumed. That is why wet wood hisses and sizzles while dry wood ignites and burns easily.



Smoke (or flame)

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 makes the bright flames that are characteristic of wood combustion. If the smoke does not burn in the firebox, it may condense in the chimney, forming creosote.



Charcoal

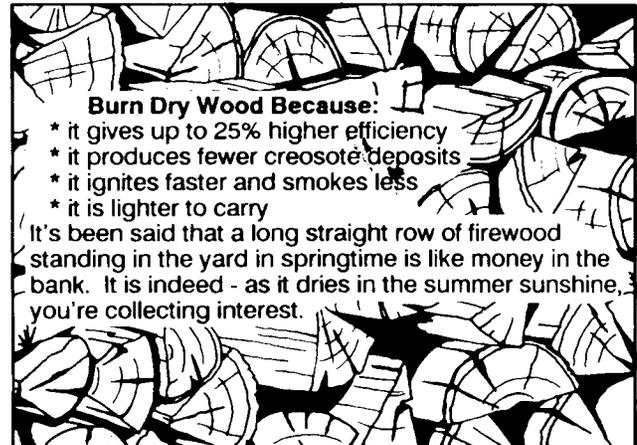
As the fire progresses and most of the hydrocarbons have vapourized, charcoal remains. Charcoal is almost 100% carbon and burns with very little flame or smoke. Charcoal is a good fuel that burns easily and cleanly when enough oxygen is present. Of the total energy content of the wood you burn, about half is in the form of smoke, and half is charcoal.



The challenge in burning wood efficiently is to burn off the smoke before it leaves the firebox. The rest of the suggestions in this fact sheet will help you to get more heat from your wood, and reduce creosote deposits and air pollution.

2. Preparing Firewood

Firewood should be split and stacked under cover in the early spring to be ready for burning in the fall. After drying in the summer sun and warm winds, the wood should be below 20% moisture content. A piece of dry firewood has large cracks or checks in the end grain. Look for these when judging the quality of firewood. Hardwoods and softwoods are chemically similar - the difference is density. Hardwoods, being more dense, produce a longer-lasting fire. However, people who live in Canada's North, where hardwoods do not grow, are able to heat their homes quite effectively with softwoods. The fireboxes of their wood stoves need to be larger to handle the greater volume of wood.



3. Starting or Rekindling the Fire

When starting a fire, use plenty of crumpled newspaper and kindling. As a guide, fill the firebox completely with loosely crumpled newspaper and hold it down with at least ten pieces of finely-split dry kindling. Softwoods make the best kindling. Find out where the combustion air enters the firebox of your stove, and light the fire there so that the fire gets plenty of air. Open the air inlets fully.

When rekindling, rake the live coals toward the combustion air inlet of the firebox. Make a compact pile of charcoal and place the kindling and small pieces of wood on and behind it. Open the air inlets fully to produce rapid combustion.

