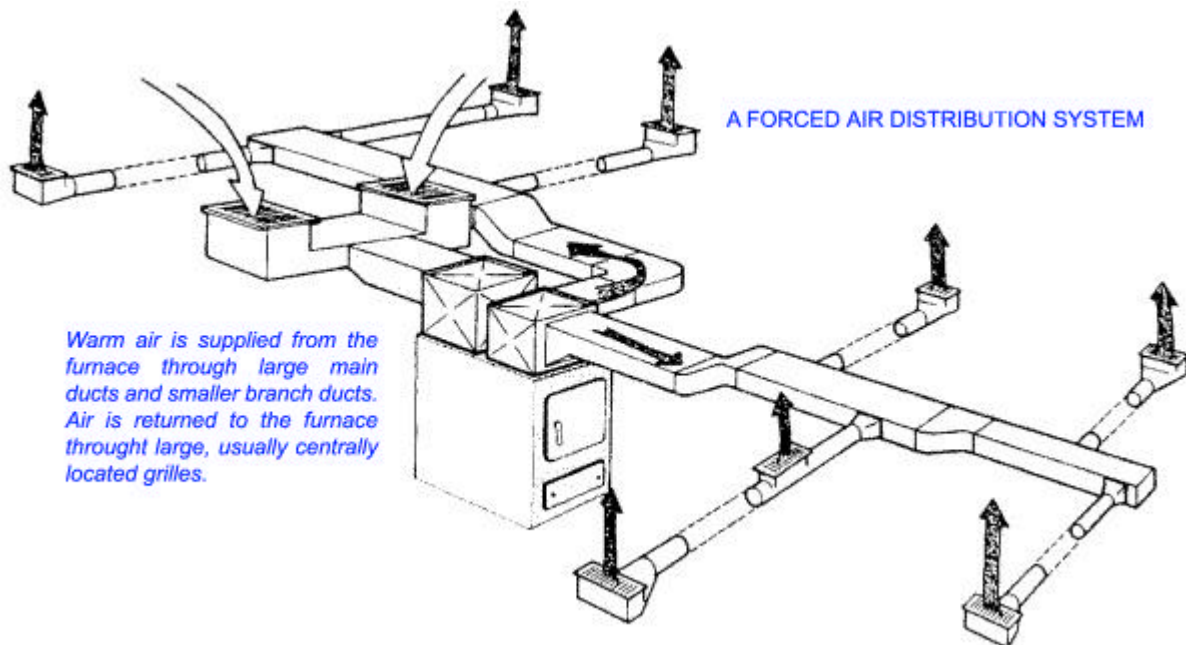


#12 CENTRAL HEATING WITH WOOD

If you want to meet all or most of your heating needs with wood, have a large house and are not interested in having a woodburning appliance in the living area of your house, you may choose to use a wood-fired central heating system.

WHAT IS A CENTRAL HEATING SYSTEM?

A central heating system consists of a furnace or boiler (which is usually located in the basement), a heat distribution system (ducts or radiators), and automatic controls to regulate heat output.



In forced air systems, air is heated in the furnace and then distributed throughout the house via a system of ducts. Hydronic systems, heat water in boilers and then pump the heated water through a system of radiators. Forced air systems are more common because they are much less expensive than Hydronic systems.

Central heating systems will cost more to buy and install than a space heater. In today's better insulated homes, a space heater may be able to meet a significant portion of your heating needs. Consult a WETT certified professional for more information.

Appliance Sizing Factors

Selecting the right solid fuel furnace or boiler size for the application is a complicated procedure that involves several factors. It is necessary to know the heat loss of the home and the average heat output of the appliances being considered. The available heat loss assessment techniques can be accurate when they are carefully calculated, but they can also produce misleading figures if they are used improperly. Furthermore, wood furnace and boiler performance ratings provided by manufacturers are not al-

ways reliable. After all the calculations are made, careful analysis and judgment are needed to adjust the results to account for the variables discussed.

Information on past fuel consumption can provide a general indication of the rate of heat loss, but is useful only in relation to experience with other homes. Another option is to simply install a woodburning furnace or boiler having an output rating similar to the rating of the appliance which is being replaced. This practice can simplify the selection of a replacement furnace, but it sometimes does not match actual house heat losses. Many existing heating systems are oversized for the building they heat, either because they were poorly chosen in the first place, or because subsequent energy conservation measures have reduced house heat loss.

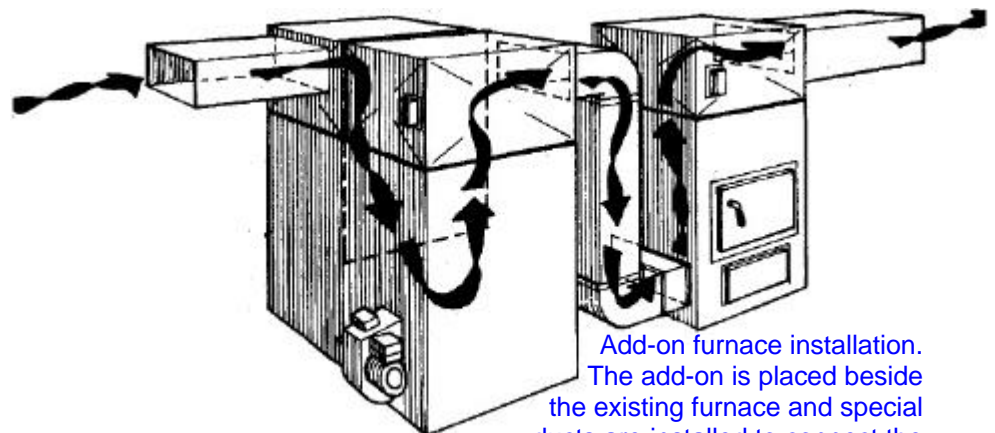
The over sizing of wood-fired space heaters has been recognized as a problem for some time. Over sizing leads the user to operate the stove at a low firing rate for most of the heating season. Smoldering fuel, chimney fires, and poor heat output control are common results of appliance over sizing. Furnaces and boilers which are oversized for the building they are intended to heat create the same problems as oversized space heaters. Keep this in mind when making appliance selections.

INSTALLATION

A wood-fired central heating system should be installed by an experienced heating contractor. The electrical controls of furnaces are complex, and must be installed carefully to ensure that the system will not overheat. Special equipment and experience are needed to install sheet metal ducting properly. As well, heating contractors may be reluctant to carry out warranty repairs and system adjustments if they were not involved in the original installation.

A furnace can only be installed if there is sufficient space and ceiling height in the basement to accommodate the required clearances. A WETT certified professional can advise you on what appliance is best for you. And be sure to check with your local building inspector to see if you need a building permit.

Ducts from wood furnaces require specific clearances from combustibles, this information is provided in the manufacturer's instructions and on the certification label. Ducts nearest the plenum require greater clearances. For Uncertified



central systems, look to the CSA B365, Installation Code for Solid Fuel Burning Appliances, for answers.

AN EQUIPMENT GLOSSARY

➤ **Independent furnaces** can be used by themselves or with a back-up such as electric baseboards. Independent wood furnaces consist of a hot air section with a firebox and heat exchanger, and a cold air section with an air-circulating blower and filters. These components are contained in one cabinet or in separate cabinets which are joined on site during installation. Independent furnaces should never be connected to an existing oil, gas or electric furnace - they are not certified for this, and the building code does not permit such connections.

➤ **Combination furnaces**, also called "dual fuel" or "multi-fuel" furnaces, include wood-oil and wood-electric combinations. They are designed so that the wood carries the heating load as long as the fire is adequate. If it is inadequate or goes out, the furnace automatically switches to the other fuel.

➤ **Add-ons** are designed to be connected to existing forced-air furnaces and to share the existing blower and air distribution ducts. They consist of a firebox and heat exchanger enclosed by a casing, and controls to interconnect the electrical systems of the furnaces for safe operation. The installation of add-ons is complex and site-specific, and consequently should only be done by a professional. If you have an existing add-on, you should have it checked by a WETT certified professional to ensure that the installation is correct.

➤ **Hydronic systems** produce either steam in a high-pressure system, or hot water in a low-pressure system. Steam is common in large industrial boilers but is never used in modern residential Hydronic systems.

Boilers transfer the heat of combustion to water in one of three ways: by surrounding the firebox with a water jacket (water leg), by passing water tubes through a heat exchange chamber above the firebox (water tube), or by passing the flue gases through tubes contained in a water-filled chamber above the firebox (fire tube). Most solid fuel-fired residential boilers are of the water leg type.

Boilers operate under pressure and each unit is pressure-tested at the factory before shipment. Steel thickness of boilers is usually greater than for furnaces in order to contain the pressure without damage.

The water heated in the boiler is distributed by a small circulating pump through steel or copper piping to wall or baseboard-mounted radiators or terminal units. The piping is arranged in one or more circuits for heating different areas or zones in the building. Zone valves at the beginning of each circuit are electrically wired to thermostats in each zone of the house. In this way, the temperature in each area of the house can be independently controlled.

There is no such thing as a safe uncertified wood furnace! A certified appliance comes with a label and instruction booklet that tells you precisely how it should be installed and operated.

KEEP IT SAFE!

- Use dry, well-seasoned wood cut to the length specified in your appliance instructions. See WISE fact sheet #11 for tips on purchasing, processing and seasoning wood.
- Follow the manufacturer's instructions for operating the appliance. In the spring and fall, when temperatures are milder, avoid long, slow burns. Instead, use small hot fires made up of smaller pieces of wood in order to help reduce condensation and corrosion problems.
- Inspect your wood furnace at least three times a year: around Christmas, at the beginning of March and at the beginning of May. Check a new furnace more frequently, until you learn how quickly deposits build up. Don't wait until you notice a problem! A leaky heat exchanger could allow carbon monoxide or smoke to enter the living area of your house. Clean the flue passages and heat exchange surfaces and inspect them for heat stress and corrosion, or have a WETT certified technician or chimney sweep do the inspection and maintenance for you. Damaged heat exchangers must be replaced immediately!

This fact sheet is intended only to provide an introduction to the topic of "Central Heating With Wood" not a "how to" manual! Be sure to consult a WETT certified professional for more detailed information and explanations.

The WISE Fact sheet Series

1. Is Your Wood Heat Installation Safe?
2. Space Heating With Wood
3. Appliance and Flue Pipe Clearances
4. Reducing Clearances With Heat Shields
5. Chimneys
6. Flue Pipes
7. Operating Your Appliance ...Safely
8. Maintaining Your Heating System
9. Fireplaces
10. Fireplace Inserts
11. Purchasing, Processing and Seasoning Wood
12. Central Heating With Wood

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Wood Energy Technical Training (WETT)

The Wood Energy Technical Training Inc is a non-profit, educational institution established in 1988. Provincial affiliates of WETT Inc are dedicated to chimney and venting system safety, and to the elimination of residential chimney fires, carbon monoxide intrusion and other chimney related hazards that result in the loss of lives and property. WETT devotes its resources to educating the public, chimney service professionals, and other fire prevention specialists about the prevention and correction of chimney and venting system hazards.

WETT has developed a training and certification program for wood heat appliance installers, inspectors, chimney sweeps and other professionals called the "Wood Energy Technical Training" (WETT) program. Be sure that any wood heat professional you consult is WETT certified. Look for the WETT logo, it's your best guarantee of reliable advice. For additional information, contact:

Wood Energy Technical Training Inc at 1-888-358-9388 or fax at 1-416-968-6818 or email at info@wettinc.ca

The local British Columbia affiliate is the Wood Energy Technicians of British Columbia, aptly named "*WETBC*". They can be reached at zigi@shaw.ca or phone/fax is 1-604-941-4172. Our web site is at www.wetbc.ca

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