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## PURCHASING AND PREPARING YOUR FUEL SUPPLY

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The quality of the fuel wood you burn can have a big effect on the efficiency and convenience of the system. The main factors that affect the burning characteristics of firewood are moisture content, tree species and piece size.

When people have trouble with their wood-burning systems, the problem is most often that their wood is not dry enough. When trees are cut, the wood moisture content ranges between 35 and 50 per cent by weight. If you attempt to burn wood this wet, it will be hard to ignite, slow to burn and will hiss and sizzle in the firebox. So much energy will be consumed in boiling of the excess water that the efficiency of combustion will be low. Properly seasoned wood ignites easily and burns efficiently.

**Firewood dries slowly and may take a full year or more to season.** Very little drying happens before the wood is cut to length, split and stacked. Wood should be stacked in an open area so the pieces can be warmed by the sun and summer breezes can carry away the moisture. Hardwoods like oak and maple dry more slowly than softer woods like spruce and poplar. Large chunks of wood dry more slowly than wood that is split small. Therefore, while finely split soft woods may season adequately in just the summer months, large pieces of hard woods may take up to two years to dry. Properly seasoned wood has a moisture content of less than 20 per cent. There are several ways to tell if firewood is dry enough to burn:

- There are cracks or checks in the end grain.
- The wood darkens with aging from white or cream colour to yellow or grey.
- Bang two pieces together; dry wood sounds hollow, wet wood sounds dull.
- Split a piece and if the fresh surface feels damp and cool, the wood is wet. If it feels dry and warm, it is seasoned.
- Burn some and if it hisses, it is much too wet
- You can test the wood using a moisture meter.

Although the energy content of dry wood per kilogram is almost the same regardless of species, softwoods and hardwoods burn differently because of differences in density. Softwoods, such as pine, spruce and cedar are less dense than hardwoods like oak, maple and beech. Although hardwood trees are plentiful in parts of Canada, there are areas, particularly in the west and north, where softwoods are the main species for fuel wood. Hardwood is usually considered the preferred firewood because it tends to produce a longer-lasting coal bed. However, softwood makes good firewood and is used successfully, even in some of the coldest areas of Canada.



### *Density of Common Tree Species*

Here is a list of the tree species commonly used for firewood. Those at the top of the list are hardest and those at the bottom of the list are the softest.

#### **HARDEST**

Ironwood  
 Rock elm  
 Hickory  
 Oak  
 Sugar maple  
 Beech  
 Yellow birch  
 Ash  
 Red elm  
 Red maple  
 Tamarack  
 Douglas fir  
 White birch  
 Manitoba maple  
 Red alder  
 Hemlock  
 Poplar  
 Pine  
 Basswood  
 Spruce  
 Balsam

#### **SOFTEST**

Even in areas where hardwoods are plentiful, softer species such as poplar can be good fuels for spring and fall use when heat demand is lower. Environmentally friendly woodlot management involves removing some of the dying and damaged trees, and the less desirable species. You can support sustainable forestry practices by accepting fuel that contains a blend of species and being willing to burn the softer woods, such as poplar during spring and fall. The newer advanced-technology stoves, fireplaces and furnaces can burn hardwoods and softwoods equally well.

The size of the firewood pieces affects the way they burn. Larger pieces ignite and release their energy more slowly than small pieces. Smaller pieces are better for short, hot fires and larger pieces are preferable for extended firing cycles. In general, commercial firewood dealers produce firewood in larger pieces than advanced wood-burning appliances can handle. It is often necessary to split some of the wood again before using it. The largest piece size for high-efficiency appliances should not exceed about 150 mm (6 in.) across the largest dimension, and a range of smaller pieces will be needed for effective stoking. At least two or three days supply of wood should be stored indoors. Wood that is brought in from outdoors in winter and loaded into the appliance immediately will cool the fire too much, making it smoky.

## **Firewood Measurement and Pricing**

Firewood is measured and sold in units called cords. A “full” cord measures 1.2 m x 1.2 m x 2.4 m (4 ft. x 4 ft. x 8 ft.) and is the official, standard firewood measure. However, 1.2 m (4 ft.) pieces are never used for home heating. Other terms, such as face cord, stove cord or furnace cord are used to describe a stack of wood measuring 1.2 m (4 ft.) high, 2.4 m (8 ft.) long with a piece length shorter than 1.2 m (4 ft.). The most common firewood piece length is 400 mm (16 in.), or one-third of a full cord, but other lengths are also sold.

The various terms and cord measures can be confusing when you are purchasing firewood. If you want to compare prices from a number of suppliers, take a tape measure to the dealers' yards and measure the average piece length. If the dealer does not price the wood in the standard full cord measure, convert the price to this basic unit. Here are some examples to illustrate the conversion.

Dealer A sells what he calls a "face cord" for \$55. You find that the pile is 4 ft. high and 8 ft. long, with an average piece length of 16 in. Divide this length (16 in.) into the full cord length of 48 in. and multiply by the price.

$$48 \div 16 = 3 \times \$55 = \$165.$$

Therefore, dealer A sells firewood for \$165 per cord.

Dealer B sells what he calls a "stove cord" for \$45. It is a pile measuring 4 ft. by 8 ft. with an average length of 12 in. The calculation is:

$$48 \div 12 = 4 \times \$45 = \$180.$$

Therefore, dealer B sells firewood for \$180 per cord.

Dealer C sells a 4 ft. x 8 ft. x 18 in "face cord" for \$60. The result is:

$$48 \div 18 = 2.66 \times \$60 = \$159.60$$

Therefore, dealer C sells firewood for \$159.60 per cord.

## Tips on Buying Firewood

If possible, avoid buying firewood in units that cannot be related to the standard full cord. Pickup truck loads and station wagon loads are impossible to measure and can be more expensive than cord measures of wood.

You can usually find firewood dealers in the yellow pages of the telephone directory or by referral from neighbours who purchase firewood. If possible, go to the supplier's yard and see the wood before you buy. Measure the average piece length to be sure it will fit in your appliance and check that all pieces are close to the same length. Look for a range of piece sizes, with no pieces larger than 150 mm (6 in.) in diameter.

If you want to process the firewood yourself, you could consider buying the wood in log lengths or getting a fuel wood permit from the local office of your provincial natural resources ministry. Sawmills may also have cut-offs, slabs and cull logs that they will sell for firewood.

You can save money by processing the firewood yourself. Get together with neighbours, buy a large truckload, rent a splitter and process the wood cooperatively.



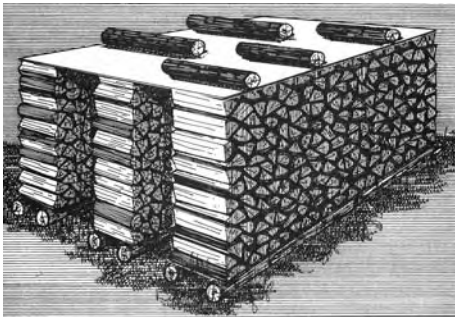
Firewood is measured in cords. A cord measures 1.2 m x 1.2 m x 2.4 m (4 x 4 x 8 ft.). Many firewood dealers sell part-cords called face cords or stove cords. Pictured below are three "face" cords with pieces measuring an average of 16 in. Together, these three face cords make up one full cord.

buying a little extra is a good idea.

## Buying and Storing Pellet Fuel

Pellet fuel is normally purchased in 18 kg (40 lb.) plastic bags. Householders who heat full time in winter with pellet stoves or furnaces usually buy their pellets by the tonne and have it delivered in the fall.

Wood pellets should be stored indoors and be kept off concrete floors on skids. If pellet fuel is exposed to moisture the pellets swell up and become unusable. Before accepting a shipment of pellets, check the contents of a sample bag to see that the pellets retain their shiny outer surface, indicating that they have not been exposed to moisture.



*THE FIREWOOD CORD – Firewood is measured in cords. A **full** cord measures 1.2 m x 2.4 m x 1.2 m (4 ft. x 8 ft. x 4 ft.). Many firewood dealers sell partial cords called face or stove cords. Pictured are three face cords with pieces measuring an average of 40 cm (16 in.). Together, these three face cords make up one full cord and should equal 3.6 m<sup>3</sup> (128 cubic feet).*