

00-04: The use of firewood for energy...

Firewood is probably the most ancient fuel used by humans and was the major source of energy for households but also for industrial applications for thousands of years up the late 1700's.

Wood fired furnaces were used to produce the brick and the cement used to build the coliseum, to produce the mirrors in the mirror gallery in Versailles, to produce the cannons used at Waterloo, just to mention a few applications throughout history.

Wood firing is still – in a global perspective – a major source of energy for millions of people though, at the same time, inefficient wood firing is responsible for inferior indoor air quality and lung diseases among poor people in several places in developing countries.

In modern – western – society, firewood is mainly used for climate heating in stoves or in boilers connected to central heating systems in single family houses. Depending on the design of the fireplace and the skill of the operator may such modern applications be create only very minor amounts of pollutants while un-skilled firing and/or outdated equipment may cause severe air pollution problems.

The first and most basic prerequisite for efficient wood log firing is that the firewood is dry.

Open air drying in northern Europe requires first that the firewood is sheltered from rain and second that it is piled in such a way as to allow air to pass through the pile to ventilate away the water vapour.

Biomass ultimately settles to equilibrium moisture content with its surrounding atmosphere, the equilibrium moisture content being uniquely determined by air temperature and by the relative moisture level in the atmosphere. The time to reach the equilibrium thus varies with latitude and climate – and so does the attainable equilibrium moisture content.

The time to reach equilibrium also varies with the initial moisture content and with the size of the pieces that are to be dried. Hence, no detailed instruction for the drying of firewood can be presented, but only some general remarks valid for firewood with cross-sectional measures less than 10 cm:

- Before drying, the firewood shall be cut and split to its final size and it should be piled so as to allow wind access but rain shelter.
- The drying period should preferably start early in the summer and extend for at the very least six months.
- If the drying period starts after summer and hence starts with a cold and wet season, it should be extended to 12 months.
- Before the actual firing, the firewood should be brought indoors 24 hours in advance.

Cost structure

Firewood is stem wood, and the production of firewood in any commercial scale will thus be competing with timber production for sawing and, in case the firewood is a second assortment, with the production of chips for pulp and paper production. Therefore will the cost and the market price for firewood be connected to the timber market.

In many cases may the firewood be a side product for the private land or forest owner, and in these cases will the actual cost be a private-economy issue out of the commercial market.

Relevant standards

For firewood, the most relevant standards (see the FOREST StandardGuide) are EN 14961-5 and EN 15234-5.