**1. Wood: the renewable fuel**

These pages provide guidance on buying firewood, burning it efficiently, seasoning wood, building log stores and using moisture meters.

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**The benefits of burning firewood**

* Firewood, unlike fossil fuels, is a renewable energy resource, carbon-neutral if the woodland it came from is replanted, and its use therefore helps the UK to achieve its carbon emissions targets.
* Firewood can be very efficiently produced: if the trees are grown sustainably within 30 miles of the point of use then the energy lost in growing, harvesting, processing and transporting firewood is only about 10%.
* Modern firewood stoves are efficient (80% or more) and easy to use.
* Depending on local circumstances it’s cheaper to burn firewood instead of coal, oil or gas for heating and this will undoubtedly be the case in future as governments encourage/force consumers to stop using fossil fuels.
* Managing land for firewood brings the benefits of any woodland, e.g. flood mitigation, biodiversity maintenance/increase, recreation.
* Financial returns from firewood can fund further woodland management.
* Firewood businesses create and sustain rural jobs.
* Waste wood that is dry, clean, untreated and unpainted can be used as firewood to provide free heat and eliminate disposal costs.

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**2. How to buy firewood for stoves**

Firewood varies according to the type of timber, its quality and its moisture content. This section gives some information on how to buy firewood for stoves and much more is easily available on the internet. [**HETAS**](https://www.hetas.co.uk/)**,**a not-for-profit organisation which creates standards and a certification scheme for the production of all types of wood fuels and **WOODSURE**,a HETAS subsidiary which has been appointed by DEFRA to administer the “Ready to Burn” firewood certification scheme that came into force in May 2021, both have useful websites.
**Buying from accredited suppliers has the benefit that quality is guaranteed, but cheaper firewood may be obtained from non-accredited local suppliers which may suit buyers who have the space and ability to undertake any additional seasoning that might be required (see Section 3).**

## ****Tips on buying firewood****

When buying firewood you are entitled to know what you are buying, but it may be difficult to get all the information you need and it’s advisable to shop around.

### Quantity

Always buy firewood by volume (preferably m³) – buying by weight could be a costly mistake if the moisture content of the logs is high. If a supplier sells by the ‘load’, ‘trailer’ or ‘bag’ then ask for the volumetric capacity. Beware: builders’ bags, sand bags, trailers, etc, vary enormously. If the supplier doesn’t know the size and is not prepared to measure up then find another supplier (you wouldn’t purchase unknown amounts of other heating fuels).

As from May 2021, firewood sold in volumes of up to 2 m³ must be certified as ‘Ready to Burn’ (see below).

 **Quality – moisture content and “Ready to Burn”**

The most important measure of firewood quality is its moisture content – a high moisture content will reduce the stove’s efficiency and produce smoke that contains noxious gases, tars and harmful particulates which contaminate chimneys and create a health hazard for the general public. Under the ‘Ready to Burn’ legislation referred to above, the moisture content of certified firewood must not exceed 20%.

Consumers may, if they wish, buy uncertified firewood in quantities greater than 2 m³ and dry it themselves to a moisture content of not more than 20% (see the later section on Seasoning Firewood). It is not illegal to burn firewood containing more than 20% moisture, but is highly inadvisable for the reasons given above.

Firewood moisture content can be checked with a moisture meter and advice on how to use moisture meters is given in Section 5.

Ask suppliers whether the firewood is freshly cut, part-seasoned or seasoned and its moisture content. There should be different prices for each of these.

 Some suppliers may claim their wood is seasoned when it obviously isn’t, in which case you have the right to send it back or ask for a discount for the lower quality and keep the wood for self-seasoning. However, reputable suppliers should know whether or not the wood has already been seasoned and what its moisture content is – it’s their job to know! If it was poor quality coal or oil for heating a complaint would be in order and low-quality firewood for heating should be no exception.

When the delivery arrives it is always best to make an inspection before the load is tipped. It is not easy to visually assess the moisture content of firewood, and it is highly recommended that a moisture meter is used. With a quick check you can accurately measure the average water in the logs which cannot be disputed.

### Size

When you order your wood you need to specify the length of the log to meet your requirements, i.e. the width of your stove doorway. However, an important factor for efficient burning is the log thickness. Not only does a log that is split to a thickness of 100-120mm (4-4 3/4 inches) dry more quickly but it also burns more efficiently.

### Type

Ask the supplier what species of timber are in the load, hardwoods or softwood? Oak, beech and ash are typical hardwoods, conifers are typical softwoods. Hardwood is generally perceived as the better fuel, but both are good fuels. A kilogram of softwood can have the same calorific value as a kilogram of hardwood. You will need a greater volume of softwood to get the same energy because softwood has a lower density. Softwood is generally cheaper and a stove burning softwood will get hotter more quickly but the same volume of hardwood will burn for longer.

There are many myths about firewood and what you can burn, the commonest being that Ash wood does not need to be dry. Although freshly-felled Ash wood **does** have a lower moisture content than some other woods it still is **WET**! There is approximately 35% water content in unseasoned Ash as opposed to maybe 50% for Oak so, even though unseasoned Ash may well burn, it will not burn very efficiently as it takes large amount of heat just to dry it out during the burning process.

### Where to buy

There are plenty of reputable suppliers in the nearby English/Welsh Marches, many of whom have websites containing useful information on their products.

# 3. Seasoning Firewood

## What is seasoned wood?

## Seasoned firewood is simply wood-fuel which has been cut to size and dried to a moisture content of 20% or less. Natural seasoning, as opposed to kiln-drying will take at least 12 months. The advantages of burning seasoned as opposed to unseasoned wood are two-fold:-

## Stove efficiency is higher because less heat is used to drive off the residual moisture and fewer logs are needed for a given heat output.

## Much less smoke will be produced. Wood smoke is a health hazard (see the *Quality* paragraph in Section 2 above) and the tar it may contain can coat the flue, making the liner more difficult to clean and liable to damage, increasing the risk of a chimney (or even a house) fire.

## Seasoning wood yourself

Correctly storing the wood is key to getting good quality dry firewood and a purpose made woodstore should be used for this. It should be protected from the rain but well ventilated to help the logs to dry out. Cracks radiating outwards at the log ends provide a rough guide to whether the wood is dry, but the only way to really know is to use a moisture meter.

Seasoning firewood checklist:-

* Split logs to a thickness of around 100-120mm (4-4 ¾ inches) to give a substantial area of bare wood from which the moisture can evaporate. This thickness is also the best size for the most efficient burn.
* Position the woodstore in sunny and dry position – South to South East facing is best, South West worst due to prevailing weather (rain) and North suffers from lack of sun.
* Woodstores should be raised off the ground.
* Slatted sides with gaps are acceptable but a closed shed will not work as the wood will not dry properly and can become mouldy.



**4. Basic operating instructions for wood stoves**

If you have bought your stove from a reputable supplier it may have come with a good set of operating instructions, but these may be missing if the stove was bought along with the property so the most important points are listed below. There is plenty of additional information available on the internet.

NB: The notes below are applicable in the countryside but there may be other factors to take into account in cities.

**Safety**

Closed stoves are much safer than open fires but still present four operating risks:-

* **Hot surfaces -**  stove sides and top can get very hot so adequate precautions need to be taken to ensure that people, especially children, are prevented from accidentally coming into contact with them.
* **Ash disposal** - ash that is hot, or even if it is apparently just warm, is not only a fire risk but also gives off poisonous carbon monoxide so allow it to cool completely before removal from the stove. Minute particles present in the ash are dangerous if inhaled so when removing ash do so in a way that doesn’t result in the dispersion of any such particles into the atmosphere.
* **Refuelling** – smoke from an operating stove will also contain these dangerous particles so follow these guideline when adding logs:-
	+ Refuel when the fire comprises mainly glowing embers and is not burning fiercely.
	+ Open the air intakes to ensure that there is a good draught.
	+ Open the door slowly, checking that the draught is pulling air from the room into the stove and that no smoke is being emitted.
	+ Add the log(s) and close the door.
	+ Keep the air intakes open until the added fuel is burning well.
* **Insufficient combustion air** – the stove then won’t burn well even with the air intakes fully open and smoke, containing poisonous carbon monoxide, may escape into the house. This will only happen if there isn’t enough air coming into the stove room from outside, which is unlikely to be a problem in older houses but might occur in a modern build with universal tight sealing. The solution is to provide a dedicated air supply from outside (see <https://www.stovesonline.co.uk/stove-ventilation.html>). Larger stoves require more air and are more likely to need a dedicated external air supply so this is a legal requirement for stoves rated at over 5 kW regardless of the house characteristics.

It is strongly recommended that a carbon monoxide alarm be kept near the stove and tested regularly.

**Tips on getting the most out of your stove**

* **Burn only seasoned wood** – this is wood that has been cut, split to 100-120mm (4-4 3/4″) thickness and stacked appropriately to dry to less than 20% moisture content. Burning wet wood will produce tar deposits and will not give an efficient heat output and can lead to chimney fires. Also try to have some logs stored in the house prior to burning, this will help as the logs will be drier but also warmer – so as not to take the heat energy away from the inside of the stove.
* **Use a moisture meter** – this can be used to test how dry your wood is when purchasing and/or before burning.
* **Firewood burns best on a bed of ash** – never clean out your stove completely of ash, instead just remove the ash box below and empty.
* **Lighting your stove –**
	+ **Be prepared** – Always have a store of dry kindling and newspaper available near your stove (softwood such as pine or spruce is good).
	+ **Light at the base** of the fire and open all air vents and reduce the air accordingly as the wood starts to burn until finally the stove is up to its running temperature.
	+ **Use a stove thermometer** – most stoves need to be burning at a certain temperature to burn the fuel efficiently and surface thermometers are useful guides to efficient wood burning. There are two types available – one for the surface of stove and one for the pipe leaving the stove.
	+ **Do not slumber burn** – there should generally be visible flames in the firebox, the firebricks should look clean and white-ish and the glass on most stoves should be clear. The main reasons for this not happening are that your wood is not dry enough or the fire is not up to the right temperature before closing down the air flow.
* **Understand your stove** – find out how your air intake controls work, get an operating manual for your stove if you haven’t already.
* **Do not overfill your stove with logs** – make sure there is good spacing between the logs.
* **Overnight burning** – this can be more difficult than it seems. It is best achieved by fully loading the stove with well-seasoned wood until the load is well alight then closing the secondary air vent to about 8 mm from fully shut. However, most advice suggests that it is best to avoid overnight burning as it may lead to tarring of the flue and the need for it to be replaced. As every installation is different, it’s best to experiment cautiously.
* **Chimney / flue maintenance** – Have your flue swept at least once a year, twice if you use your stove daily. Keeping the flue clear of deposits will not only ensure a good draw and effective stove operation but will minimise the risk of a chimney fire. Keep a record of sweeping in case you need it, e.g. for an insurance claim following a chimney fire.
* **Smoke and carbon monoxide detectors** -check these regularly

**5. Moisture meters**

Moisture meters can be used in various ways for woodstove use. They are often used for those people who are cutting and seasoning their own wood. But more importantly they can be used to check the quality of wood bought from suppliers and make judgements on when firewood is ready for burning.

Most moisture meters have instructions included and these should be followed. The basic process of finding out the moisture content of logs is as follows:-

**How to test the moisture content of your wood supply**

1. Take a random selection of 2-3 logs per cubic metre.
2. Split each log down the middle
3. Using the meter push pins, take three measurements on the freshly split surface of each log: 5 cm in from each end of the log and one in the middle.

4. The average of all the reading will give an approximate value of the moisture content of the volume sampled.


**Remember:** Seasoned firewood should have a moisture content of not more than 20%, but try to get it lower. Bringing the wood in to the house a week or two prior to burning will help to dry it further and warm it and thus improve stove efficiency.

**6. Further information**

If you would like to more about firewood, how wood burns, safety or simply browse the net on related topics please have a look at the advice and links below. There is also a great deal of useful information on stove suppliers’ websites. Happy browsing!

* Forestry Commission – <http://www.forestresearch.uk/>
* HETAS – <http://www.hetas.co.uk/>
* Stoves Online **-** https://www.stovesonline.co.uk/stove-ventilation.html
* Woodsure - <https://woodsure.co.uk/>