

SIMPLE WAYS TO CHECK THE QUALITY OF WOOD PELLETS



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Wood pellets can have a wide range of qualities. As a general rule the cheaper the pellets, the lower the quality.

When buying wood pellets one should insist on a declaration of the quality according to the recent Irish Standard I.S. CEN/TS 14961:2005. This standard describes the specifications of solid biofuels.

Consumers need to examine the following characteristics of the pellet:

- ▶ **The dimension** – Most pellets produced as fuel are either 6 or 8 mm diameter and about 3-4 times the diameter in length;
- ▶ **The moisture content** – This should be about 8-10%;
- ▶ **The ash content** – Good wood pellets have a very low ash content of below 0.7%;
- ▶ **The mechanical durability** – The mechanical durability is a measure of how well the pellets can stand handling. Every time pellets are handled, some of them break and all of them show some wear, which will increase the amount of fines in the goods;

- ▶ **The amount of fines** – Fines in the pellets hinder the pellets from tumbling down to the in-feed auger, thus giving disturbances in the fuel feeding of the boiler. Boilers are adjusted to burn wood pellets and if an increased amount of fines are put into the burning chamber, the flame might get too hot because the fine particles burn faster than the wood pellets. In the worst case the ash might sinter, which means that one has to clean the burner after cooling off.

The amount of fines should be declared for each delivery. The amount of fines is measured at the last possible place on the production site. It should preferably be less than 1%. Pellets are usually screened before leaving the production facility. Pellets in small or big bags usually have less fines than pellets that are delivered in bulk. Pellets that are blown into a silo can show increased amount of fines;

- ▶ **Additives** – If the proper feedstock is used it should not be necessary to use additives in the production of wood pellets. Wood pellets are usually made of coniferous sawdust. Without a binding agent it is difficult or almost impossible to produce wood pellets from hardwood species. If additives have been used, the kind and amount should be declared;
- ▶ **Bulk Density** – This measures the weight of a certain volume of loose wood pellets and should be in the order of 650 kg/m³ loose volume. If the weight is too low, the pellets are not pressed hard enough and that might result in increased amounts of fines.



The following are some easy tests which can be done at home without any laboratory equipment.

By using smell, eyesight and some small tests it is easy to check if wood pellets are ok.

First of all put a few handfuls of pellets into a plastic bag. Put your head close to the bag and sniff the odour of the pellets. They should smell of freshly cut softwood. If they smell of anything else, beware.

Look carefully at a handful of pellets. Any particles with a colour other than wood are suspicious. The colour of the pellets should be light brown if they are made of clean coniferous sawdust. Dark brown particles are a sign of bark and thus an increased amount of ash. Pellets might have a dark outside, which is due to friction in the pressing dies. This is not a problem as long as the pellets are of light colour once broken.

Take one long pellet and light it at the tip. The smoke should smell of burning wood. If it smells of anything else, it is not of good quality.

Take a small handful of pellets and put them in a glass with water. The pellets should dissolve into sawdust within minutes. If not, a binding agent might have been used or improper feedstock. Once the pellets have been dissolved swirl the glass and see what settles in the middle of the bottom of the glass. The heaviest particles will settle there. If there is a large amount, it might be possible that sander dust i.e. wood dust and dust from sand paper, has been added to the pellets. This increases the amount of ash and the risk of sintering.

Take any kind of vessel larger than one litre and weigh that on a kitchen scale. Note the empty weight. Fill the container to the brim with wood pellets and weigh again. Note the weight. Fill the container with water and weigh again. Deduct the weight of the container from both other measurements. Then divide the weight of the pellets by the weight of the water. The result should be between 0.6 and 0.7 kg/litre and preferably around 0.65kg/litre. This is a measure of proper pressing. If pellets are below 600 gr/litre then they have a low durability.



Above: Poor Quality Wood Pellets

Below: Testing Quality of Wood Pellet.



These simple tests and some common sense will prevent most problems with wood pellets. As a general rule, if wood pellets are cheap they are of poor quality and should be avoided. Good quality pellets will be more expensive but are a much better investment as they burn more slowly and release fewer emissions.