

# Benefits of Wood Pellets

Article courtesy of [www.woodpellets.com](http://www.woodpellets.com)

- Wood pellets are a carbon neutral heating fuel
- Wood pellets come from residuals, by-products or sustainably managed forests
- Using wood pellets stimulates our economy and creates thousands of green jobs
- Modern pellet fuel combustion systems are extremely clean-burning, with extremely low emissions
- Using biomass for heat is more efficient than allocating those same resources to make electricity or biofuels

By using wood byproducts that would otherwise go to waste, wood pellet manufacturers create a heating source that has very little negative impact on the environment. In some parts of the country, wood pellets are made from trees killed by an insect infestation. If those dead trees were left to decompose in the forests, they'd produce more greenhouse gases than they would if not used for heating purposes. People who heat their homes with wood pellets are using a clean, carbon-neutral renewable fuel that emits a low level of particulates into the atmosphere. Wood pellets contain nothing but wood.

Most custom Wood pellets are packaged in plastic bags and stacked on a pallet. The bags are shrink-wrapped with a poly cover for short-term storage and transport from the factory to the retailer, then to your home. This cover is not really intended for long-term storage. Most customers store their pellets in a garage, basement, or shed. If you must store your fuel outside, it must be protected from the weather. Keep fuel off the ground, and protect it from snow and ice buildup. Do not rely on the shrink wrap cover to keep your fuel dry. Instead, cover it on top and all four sides with a weatherproof tarp. Avoid carrying fuel over from year-to-year as wood pellets are extremely absorbent, and will gradually soak up airborne moisture.

Stove owners with an average size home living in a cold winter climate will go through three to four tons a season. However, that amount can vary depending on the size of your home and if you use other heating options.

## Wood Pellet Color

When choosing fuel, you may notice that there are many different colors. Usually, lighter fuels are made of softwood, and darker pellets are hardwood. The fuel in the center of this photo is made from lodge pole pine that died from pine beetle infestation. The enzymes secreted by the insects makes the wood look blue



in colour, so pellets made from this fibre are darker in colour. Some softwood "whole-tree" pellets are also darker because of bits of bark and needles that are mixed in with the wood. In other words, it's tough to pick a "best" pellet based on color.

## Wood Pellet Length

Pellet length varies widely. You will see differences between brands, and fuel types. You may even see differences from batch-to-batch or bag-to-bag from the same brand. While consistency in length is preferred, variability is normal due to the manufacturing process. How does this affect burn? Longer pellets will feed less fuel into the burn pot with every rotation of the auger than shorter pellets. Shorter pellets will provide more fuel to the burn pot than the longer pellets. As a result, you must be prepared to make minor adjustments as needed to reduce the feed rate or to increase air flow through the burn pot to maintain the correct fuel-to-air ratio. If you do not, you could end up with incomplete combustion,



leading to more accumulations of ash and clinker, blackened glass, a lazy fire, and lower heat transfer efficiency.

## Wood Pellet Density

Pellet manufacturers compress the wood fiber to a consistent density of at least 40 lbs per cubic foot. That means that if you fill a one cubic foot container with pellet, it should weigh at least 40 lbs. Compressing fuel to the exact density on a consistent basis is difficult, so most pellet mills compress to 41 lbs or 42 lbs. It is also possible that fuel may be as dense as 44 lbs or more. If one bag of wood pellets is denser than another, it will deliver more fuel to the firepot with each rotation of the auger than one that is lower in density. Here is a simple test you can perform if you have access to two different brands of pellet fuel: Stack eight bags of one brand on top of one another next to a similar stack of the other brand. The taller stack is the one that is less dense. Being less-dense or more-dense is not a bad thing, but it will change the required fuel-to-air ratio that will be required by your appliance to burn efficiently. If you switch from a less-dense pellet to a more-dense pellet, you must be prepared to reduce your feed rate or to increase airflow through the burn pot to compensate.



## Hardwood Pellets vs. Softwood Pellets

**Fact: Quality Pellet Fuel is More Important than Species**

Traditionally, hardwood has been the preferred fuel in wood stoves and fireplaces because it naturally has a lower moisture content, is a denser fuel, burns longer, and has hotter coals. After wood chips are ground into



sawdust, they are dried to a consistent moisture level. The sawdust is then compressed into pellets at a common density (again, approx. 40 lbs per cubic foot). It doesn't matter if the sawdust came from softwood, hardwood, or a blend of both; it is all compressed to the same density. If you look at the potential BTU content within each different wood species, you will find they are similar. On average, wood pellets will generate approximately 8000 BTUs per pound at 6% moisture (note: aside from causing pellets to crumble, higher moisture content will also severely impact BTU content. This is why it is so important to keep fuel dry).

## Quality is Most Important

After you normalize the moisture content and density, wood pellets have about the same heat value, but there are still differences between pellet mills and brands. Ash content, ash characteristics, and pellet length do affect burn and maintenance requirements.



While premium pellets are all under 1% ash content, the actual content could be anywhere from .25% to .8%. After burning 10 bags of fuel (approximately 400 lbs), that could make a difference between generating 1 lb of ash or 3 lbs of ash. With good maintenance habits, you may not even notice a difference, but it is worth noting the lower quality version of the same "premium" fuel generates up to three times as much ash.

What happens to all this ash? Some ash is very high in mineral content. Under high temperatures, this material will melt then re-harden as scale on surfaces within the stove; particularly within the burn pot. Heavier ash particles will fall to the sides of the firebox and down into the ash pan. Lighter particles will collect on the heat exchanger or within firebox air passages. And more still will settle within the tee and horizontal sections of your vent system. The lightest ash particles will be exhausted right out the vent. The difference in ash content can vary by tree species. It can also vary according to region based on the mineral content within the ground that the tree was grown on. Your appliance will perform best with regular maintenance to keep ash under control.

Most manufacturers follow standards set by the Pellet Fuels Institute. The purpose of these standards is to ensure consumers can expect quality & consistency when purchasing fuel.



Not all manufacturers are members of the Pellet Fuels Institute. As a result, there may not be any independent testing of their fuel to confirm adherence to PFI standards. To learn more about fuel quality standards or to

see if your manufacturer is a member, click on the following website link:

<http://www.pelletheat.org/2/quality.html>

PFI standards are noted below.

**PFI-graded fuel must meet tests for:**

- Density: consistent hardness and energy content (minimum 40 pounds/cubic foot)
- Dimensions: length (1 ½" maximum) and diameter (1/4" x 5/16") to assure predictable fuel amounts and to prevent jamming
- Fines: limited amount of sawdust from pellet breakdown to avoid dust while loading and problems with pellet flow during operation (amount of fines passing through 1/8" screen no more than .5 percent by weight)
- Chlorides: limited salt content (no more than 300 parts per million) to avoid stove and vent rusting
- Ash content: important factor in maintenance frequency

member of



**Pellet Fuels Institute**  
www.pelletheat.org  
MANUFACTURERS  
**GUARANTEED ANALYSIS**

<b>Grade:</b>	
<b>Material:</b>	
<b>Ash:</b>	
<b>Fines:</b>	
<b>Sodium:</b>	

### Grades of Pellets

Pellet mills produce two grades of fuel – Premium and Standard. The only difference between the two is ash content. Standard grade fuel is usually up to 3% ash content, while premium grade is less than 1 percent. This difference is a result of the pellet contents. Standard pellets are derived from materials that produce more residual ash, such as tree bark or agricultural residues. Premium pellets are usually produced from hardwood or softwood sawdust containing no tree bark. Premium pellets make up 95 percent of current pellet production and can be burned in all appliances. Standard pellets should only be burned in appliances designed to burn the higher ash content pellets.