Wood Pellet Stove 101

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Wood pellets are made mainly of sawdust, shavings, and fines leftover after processing trees for lumber and other wood products. At a pellet mill the material is dried, sized, compressed, and cooled as it is bagged. The pellets are put into bags that weigh 40 pounds. Pellets are sold as a ton with fifty bags on a pallet, or by a large bag referred to as a Super Sack. The Super Sack is 2,000 pounds in a large nylon bag and a tow motor or tractor type equipment is needed to move the Super Sack. Some retailer will sell pellets by the forty pound bag.

Pellet mills follow industry standards to create a product that is consistent in content, density, size, and quality. There are two grades of pellet fuel currently available on the market: standard and premium grades. The main difference between the two is the amount of the ash content after the pellets burn. Premium grade is the more common of the two grades. One of the leaders in the business is "ProPellet" which markets Premium grade which is well above the industry standard.

USA Pellet Fuel Manufacturers produce the highest grade of pellet fuel, almost all of which is classified as Premium Grade. Pellet manufacturers are encouraged to label their fuel and to have it tested on a regular basis.

There are many advantages in using wood pellets. No trees are cut to make the pellets. They are made from leftover wood from the flooring and cabinet industry. Burning pellet fuel actually helps reduce waste created by lumber production or furniture manufacturing.

There are no additives put into the pellets to make them bind together, burn longer, or more efficiently. Pellet fuel does not smoke or give off any harmful fumes during the burn process other than during ignition and at the end of the burn process. The burning process is highly combustible and produces little residue as long as your stove is burning the way it was intended too. Using this fuel is environmentally friendly as it

reduces the need for fossil fuels. Wood is one of the only renewable energy sources other than shelled corn. Trees will grow again and again with proper management.

Wood Pellet Burners come in a couple different applications. There are simple Wood Pellet Stoves that burn from 8,000 BTUs to 55,000 BTUs. There are Pellet Furnaces that burn from 8,000 BTUs to 75,000 BTUs. There are Wood Pellet Boilers that burn from 10,000 BTUs up to and over 190,000 BTUs. The point to remember is that the average home furnace burns around 65,000 BTUs. (See BTU explanation at end of article).

With all Wood Pellet burning appliances you will need some form of electricity to run the blowers, auger, and control boards. This is the same with your home furnace now. If you intend on using a Wood Pellet Stove for "emergency heating" you need to consider a battery back up system, a generator, or some type of solar power.

The most common type of Wood Pellet Burner is the Pellet Stove which is a "spot heat" type of system. The stove is installed in the same area that the people are generally in. For example: If the majority of the time you and your family use the living room, this would be the perfect place to situate your stove. Wood Pellet Stoves come in a variety of styles, shapes, and sizes to meet your room size and home décor.

A Wood Pellet Furnace it is usually in an attached garage, utility room, or Basement. A Wood Pellet Boiler can be located outside. These are normally larger systems and are normally not made for home décor and designed for function.

Pellet Stoves are a special made stove that has a hopper, auger system, burn pot, combustion blower, circulation blower, and ash system. Generally the hopper is filled and the stove is turned on and the fire started. Some stoves require manual lighting of the fire and others have an igniter. The Wood Pellet Stoves feed wood pellets to the burn pot through an auger system that is controlled by the stove's control panel. Basically if you want more heat, you have the stove deliver more pellets to the burn pot. The Combustion Blower delivers a constant source of air to the burn pot and also doubles as the exhaust blower for the stove. Wood Pellets will not stay lit on their own and would smolder out without the combustion blower or some other type of system to keep them lit. Some Wood Pellet Stoves or Furnace require outside air for the combustion process.

As the fire burns in the burn pot it heats the inside of the stove. The circulation blower draws in room air into the stove and circulates it through chambers in the stove, not coming in contact with the gases or fire. The circulation blower than directs the heated air out of the stove and into the room. Larger Furnaces direct the air into duct work of the house. Wood Pellet Boilers use the heating process to heat water. The water is then directed to some type of heating system whether it is radiant floor, a heat exchanger, or baseboard.

As the fire burns in the burn pot, ash is created. This is called fly ash in a Wood Pellet Stove. The fly ash is blown from the burn pot when the weight of the pellet becomes light enough through the combustion process. The fly ash will go into the ash system and some of it is also directed into the exhaust system. The average pellet stove's ash system needs to be cleaned approx every 7-10 days of constant non stop running of the stove. Some Wood Pellet Stoves need to be emptied sooner and some later depending on the design of the stove and at what setting the stove is burning. If you burn more pellets you will have more ash.

The easiest way to clean the inside of the stove is with a shop vacuum. Once your stove is shut down and cooled you clean the entire ash and burn pot area with the shop vac. They do sell "fire resistant" shop vacuums but this is not required and can be done with a standard vacuum system and a clean filter. The cleaning of a stove takes less than 10 minutes and again is done every 7 – 10 days of constant running Wood Pellet Stove burning 24 hr a day running 7 days a week.

The chimney system a wood pellet stove needs is mainly a 3" diameter double wall pipe system. Some stoves require a 4" diameter double wall pipe. The diameter of the chimney/venting system is determined by the stove manufacturer or the length of chimney run and bends to vent the Wood Pellet stove. The main thing to adhere to with the chimney system is do what the stove manufacture directs. One option on running the chimney is taking it right out an outer wall. This means you do not have to run the chimney over the peek of the roof. With a pellet Stove insert, the Pellet insert will slide into an existing fireplace. A 3" or 4" liner is used and can be configured a few different ways. Simpson Dura Vent Pellet Vent Pro is an excellent venting system for Wood Pellet Stoves. Dura Vent Chimney has as little as a 1" clearance to combustible surfaces.

Your chimney system will need to be cleaned every 10-12weeks. This cleaning is nothing like a wood stove or wood burning fireplace. When Wood Pellets burn correctly there is no creosote build up in the chimney. Fly ash will accumulate inside the chimney and has to be removed. At the start of the burn season you will also want to inspect your chimney to make sure insects (i.e. bees or wasps) have not blocked the pipe or small animals built a nest. All connections inside the structure also need to have high temperature silicone sealing the pipe connections. Please remember to adhere to all building codes, stove manufactures recommendations, and consult with your insurance agent.

When you are low on pellets all you have to do is pick up more while you are out or some retailers will deliver them to your door. There is no cutting, chopping, stacking, or storing cut wood. A pellet appliance is capable of generating 8,000-500,000 BTU of heat. An entire house can be heated by pellet fuel when the proper appliance is installed and in the right area. The average stove will be in a room but that heat will transfer to close areas of the house. Some stoves can be connected to existing HVAC ducting and transfer heat to the entire house. There are a couple pellet burners that are outdoor boiler type systems that provide hot water to the house.

The average home with a Wood Pellet stove will burn anywhere from a bag a day to two bags a day during the heating season. This all depends on the weather outside, the insulation value of the house, how often your outside doors are open, size of the wood pellet stove, and efficiency of the stove. Older wood pellet stoves have an average of a 65% efficiency rating. The newer stoves being made now have efficiency rating of 80% or higher.

The cost of pellet fuel may depend on the geographic region where it is sold, and the current season. Pellet fuel costs about the same as cord wood and less than most other fuels. Pellet fuel is estimated to be only about one-third the cost of electricity that is used for heating. This could mean a large savings over the years!

Whether you live in a condominium in the city or a home in the country, pellet fuel is among the safest and healthiest way to heat. This technology is also valuable for non-residential buildings such as hotels, resorts, restaurants, retail stores, offices, hospitals, and schools. Manufacturers of stoves are constantly designing new models which have more heating applications.

Pellet stove styling can vary depending on the stove manufacturer. Some stoves are very fancy with porcelain, nickel and brass. Some are very plain and look like a large tool box or a small refrigerator. Wood Pellet Stoves can have computer control panels and digital thermostats including infrared remote controls. Other Wood Pellet Stoves have dials to control auger and blower speed. There are zero clearance stove, inserts, and free standing.

Over 500,000 homes in North America now enjoy the convenience and warmth of a Wood Pellet stove, furnace, or boiler system. This is an environmentally friendly heating option.

BTU is defined as British Thermal Unit, In North America, the term "BTU" is used to describe the heat value (energy content) of fuels, and also to describe the power of heating and cooling systems, such as furnaces, stoves, barbecue grills, and air conditioners.

This is a breakdown of what the most common forms of energy's BTU rating.

Wood Pellets	8,300 BTU per pound (moisture content at 4.5%)
Shelled Corn	7,200 BTU per pound (moisture content at 11%)
Natural Gas	100,000 BTU per therm
Propane	92,000 BTU per gallon
Electricity-Resistance	3,412 BTU per kWh
Bituminous Coal	12,000 BTU per pound
Anthracite Coal	14,000 BTU per pound
Seasoned Firewood	7,000 BTU per pound on average (moisture content at 20%)
#2 Fuel Oil	138,000 BTU per gallon
Kerosene	135,000 BTU per gallon

For a cost per BTU rating you can go to the Pellet Fuel Institute's web site at http://pelletheat.org/3/residential/compareFuel.cfm for a chart that you enter what you are paying for that fuel and it will indicate what would be the cheapest way to heat your home. You will need to know the efficiency of the appliance you are using. Please consider with Natural Gas and Electricity you have recovery fees. In some states (i.e PA) there is no state tax on Wood Pellets or Shelled Corn for home heating.