

Stoves, Furnaces Built For Farm Use



"It'll burn 5-ft. dia. bales right down to the last straw with very little smoke," says Guy Swanson about his first-of-its-kind big bale furnace.

Round Bale Burner Has A Built-In "Stir Stick"

Guy Swanson of Pictou, Nova Scotia, says his big bale furnace has some important new features that other outside boilers don't have.

"It'll burn 5-ft. dia. bales right down to the last straw with very little smoke. One or two large round bales a week will heat an average size house for less than \$30," says Swanson. "And if you run out of straw or hay, you can burn wood in it."

The furnace has a 5 by 5-ft. 4-in. fire chamber and 5 by 6-ft. water jacket and weighs more than 4,000 lbs. It has a full-size door 15 in. off the ground that opens up for easy loading of the bale and for ash removal. Big bales are loaded into it with a tractor or skid loader.

The fire chamber is built with 1/4-in. thick steel plate surrounded by water, including at the bottom part of the chimney, so it can collect heat as it exits the furnace. "This design reduces heat going up the chimney by 30 percent," says Swanson. The loading door has a domed design, with a heat shield built inside the door, to keep the door from warping. A fan mounted inside a metal box outside the door blows air into the furnace.

One of the furnace's key features is a steel arm and blade inside the fire chamber that slowly rotates around the bale, loosening hay at the bottom of the bale as it turns so air can get to the hay to keep it burning. The arm and blade mount on a shaft that's chain-driven by an electric motor at the back of the fire chamber. The blade mounts on the end of the arm, which slowly rotates around the fire chamber like the hands of a clock. The blade passes under the entire bale at the perimeter of the firebox to pull hay off. As the bale gets smaller, the blade lifts the bale part way up

the side of the fire chamber, and the bale then tumbles back down into the fire again.

"It works on the same principle as burning a bale in your yard. If the bale doesn't burn fast enough, you take a pitchfork and push it around to let more oxygen into the bale for better burning."

The furnace is not a boiler and operates at zero pressure. "It uses a forced air draft instead of a natural draft in order to do a better job of burning," says Swanson. "Our furnace is open to the atmosphere. The water jacket around the outside of the firebox captures heat and pumps hot water to the building to be heated." Swanson has used the furnace to heat his shop for two years, and cut his heating bill by more than 75 percent.

An aquastat keeps the temperature in the water chamber steady, and a thermostat controls the temperature in buildings. "The fire chamber is completely surrounded by water inside a metal insulated jacket, so the outside of the furnace is the same temperature as the outside air," says Swanson.

A heat sensing relief valve dumps hot water into the fire chamber to dampen the fire if the power ever goes off or the pump stops.

Since the furnace operates at zero pressure, you can use it with unit heaters made from used car radiators or old school bus heaters.

Price with automatic temperature control and circulator pump is \$15,600. Comes with a 10-year warranty.

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Grain Burning Stove Designed For Wheat

A new patent-pending, grain burning stove was factory-designed to burn wheat. It's also been successfully tested with rye, peas, beans, triticale, durum, corn or wood pellets.

Prairie Fire Grain Energy is owned and operated by Delmer and Janet Hering of Bruno, Sask., who've used a grain heating system to heat their home since 1993. They'd been marketing a corn stove for many years when customers started asking for a stove that would burn wheat.

"To our knowledge, this is the first wheat burning stove ever tested and certified as a wheat burner," Janet says. "It offers improved design for combustion air, increased safety features, and improved air flow, along with good looks."

The new stove will be available to customers in limited quantities this fall. Its small physical size of 27 by 33 by 39 in. makes it ideal for home use.

The Herings had their design tested at the Intertek facility in Middleton, Wis., where it gained the Warnock Hersey certification as a wheat burning stove in Canada and the U.S.

"It's recommended that the grain be free of foreign objects such as excessive straw and chaff or rocks before use. Bin run grain can be used in the Prairie fire stove. Oil seeds and grains with high hull content, such as barley and oats, don't work well in the stoves," Janet cautions.

"The Prairie Fire PFG 060 is safe and easy to operate because it provides heat from its front panel, while the top, sides and back of the stove allow minimal clearance to combustible materials," Delmer says. "That means you don't need fire resistant material around or below the stove."

He points out that the stove has many safety features that reduce the risk of haz-



Randy Severson's 600 Rocket furnace introduces combustion air from the top, which allows the furnace to burn corn at a very high temperature.

Veteran Corn Burner Designs Easy-To-Maintain Furnace

Even with \$4/bushel corn, you can save half on heating costs with Randy Severson's 600 Rocket corn furnace. Propane at \$1.39/gal. is equivalent to \$7.36/bushel of corn, says the Pocahontas, Iowa, inventor.

Owner of SAR Biomass Energy Systems L.L.C., Severson has been building and selling corn stoves for eight years, including hot water boilers and grain drying systems. Last winter he installed his new 600 Rocket furnace in a 40 by 500-ft. poultry barn. The furnace and a 12-bu. bin were placed in a 12 by 14-ft. shed attached to the barn. A 500-bu. bin outside fills the inside bin which automatically augers corn into the top of the furnace. Combustion air is also introduced from the top, which allows the furnace to burn corn at a high temperature.

"We can run bin-run corn with fines and small pieces of cob without plugging or putting the fire out," says Severson. "Corn moisture should be between 13 and 15 1/2 percent."

"Another thing that sets Severson's stove apart from others is its easy opening heat exchanger. "We designed this especially for poultry and livestock barns to keep bacteria out," Severson says. Simply remove three plugs and it can be pressure washed clean.

"The best thing about this furnace compared to propane is that there's 20 percent less moisture in the barn, because we go through the heat exchanger," Severson says.



Stove features an easy-to-clean heat exchanger. Simply remove three plugs and it can be pressure washed clean.

"Propane puts out moisture, one gallon of water for every 11 gallons burned." In addition, open gas heaters emit carbon monoxide, which makes chickens or other livestock sleepy so they don't eat as much.

The 600 Rocket can be geared down to 100,000 btu's in warmer weather and in cold weather geared up to 600,000 btu's, consuming 85 lbs. of corn per hour. It took 268 bu. of corn to raise a 40-day flock of chickens last year in the dead of winter, Severson says.

The patent-pending 600 Rocket costs \$9,200 and is available on the SAR website or through distributors.

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"To our knowledge, this is the first home heating stove ever tested and certified as a wheat burner," says Janet Hering.