

“Cleanest-Burning Wood Furnace In The World”

No wood burner on the market burns cleaner than the Kuuma Vapor-Fire 100, in-house furnace, according to the manufacturer.

The hot air furnace recently tested out at 86 percent heat transfer efficiency, 98 percent combustion efficiency, and produced less than a gram per hour of particulates. At a slow burn it did even better with an overall combustion efficiency of 99.9 percent. The smaller Vapor-Fire 200 scored nearly as well. These results make both stoves eligible for tax credits of up to \$1,500 for purchase and installation.

Daryl Lamppa says the furnace is unique to the industry. “Ours is the only non-boiler, wood gasification furnace in the industry that we are aware of.”

Unlike other true gasification burners, logs in the fire chamber of the Kuuma burn at a controlled rate from front to back. Controlled release gas and vapors result in near complete combustion. Kuuma furnaces are designed to burn on low (3 to 4 lbs. of wood per hour), medium (5 to 7 lbs./hr.) or high (8 to 9 lbs./hr.), depending on outside temperatures.

Heated air is fed into the furnace plenum for distribution throughout the house. Lamppa explains that the fan in the plenum runs at a constant 250 cfm once the furnace is hot enough. When the house thermostat calls for more heat, it kicks up to 1,500 cfm until the thermostat reaches the desired level.

Lamppa explains that it's the 24-volt, computer-controlled, constant burn that produces a near complete burn with practically no polluting particles. It's when wood smolders that creosote and other pollutants are produced.

“If you see smoke, you have creosote being

produced,” says Lamppa. “Ours produces practically no visible smoke once the fire starts and no creosote when using seasoned firewood. We take our stovepipes apart once a year and just blow the dust out.”

Although Lamppa and his father Herb have been making the Kuuma Vapor-Fire 100 for 28 years, they only recently sought efficiency certification. “We knew it burned clean, but in order for it to qualify for the 2009 to 2010 Home Energy-Efficiency Improvement tax credit, it needed to be certified. We now know this is the cleanest-burning wood furnace in the world.”

To qualify for the tax credit, wood stoves and furnaces must have a thermal efficiency rating of 75 percent or above and emissions of less than 7.5 grams per hour for non-catalytic models and 4.1 grams per hour for catalytic models. At 84 percent thermal efficiency, the non-catalytic Kuuma 100 is 5 percent ahead of even the most efficient catalytic wood stove on the EPA certified list of tax credit approved wood stoves. At less than a gram of particulates, no other non-catalytic stove comes close and only a handful of pellet/catalytic models burn cleaner.

Another sign of an efficient burning furnace is that you burn less wood, notes Lamppa. Even with a continuously burning design, he says the Kuuma takes half the wood of a conventional non-gasification furnace.

“We had a mild winter this year, and I left my furnace set at the low setting all winter,” says Lamppa. “I have a 3,200-sq. ft. house, and I only burn 4 to 5 cords of wood a year.”

The Kuuma Vapor-Fire 100 combustion chamber is only 23 in. long by 15 1/2 in. wide by 20 in. high. The fire door is 12 in. by



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12 in. and takes a maximum wood length of 22 in. Even with that limited size, Lamppa says that when set on medium burn, a single hardwood fill will last for 10 to 12 hours. Hardwood coals will last another 6 to 12 hours. When reloading the chamber, coals are simply pulled forward before fresh wood is added. Once the door is shut, the logs quickly ignite and burn at the preset rate.

“I have customers who tell me they light their furnace once in the fall and never light

another match all winter,” says Lamppa.

The Kuuma Vapor-Fire 100 is priced at \$4,350. It stands 50 in. high, 32 in. wide and 52 1/2 in. deep. The slightly smaller Kuuma Vapor-Fire 200 is priced at \$3,850.

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Sifter outside Heinz's house removes fines and a blower gets rid of the chaff. Clean corn flows into a 2-in. pvc pipe that runs through basement wall and into plywood bin inside.

Shop Vac Used To Fill Cornstove Bin

Kevin Heinz likes his cornstove, but his knees didn't like the abuse they endured climbing up and down stairs with 5-gal. buckets to dump 18 bushels of corn into his basement bin.

So the Minburn, Iowa, resident built a system that cleans and sucks corn into the bin within half an hour — without any stair climbing.

The setup starts outside — 35 ft. away from the bin in the basement. Heinz made a sifter with a hardware screen floor to take out fines and other trash. A blower at the end blows chaff away. The good corn flows into a 2-in. electrical pvc pipe that runs through the basement wall and into the plywood bin inside.

Heinz made the bin out of 3/4-in. plywood and 2 by 2-in. studs on the corners. Everything is caulked and screwed. The lid has 3/4-in. closed cell foam around the edge to make it fairly airtight. He hooks up his 5 hp shop vacuum to a pvc fitting on the lid.

“I just turn on my shop vac and it sucks, and the corn rattles on through and fills the bin up,” Heinz says. “Make sure you put a Gore-Tex® filter on the shop vac like you use



To suck corn into bin, Heinz hooks up a 5 hp shop vac to pvc fitting on bin's lid.

for sheetrock so you don't blow dust around. They are expensive, but they last forever.”

The 18-bushel bin lasts 20 to 30 days depending on the temperature.

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Add-On Axle Pto Lets Semi Drive Farm Equipment

Low horsepower pto's have been available for trucks for decades, but Harry Wallace has figured out a relatively inexpensive way to add 250 to 1,000 hp pto's to semi tractors.

“I sell the axle ready to go,” says the Galva, Ill., inventor of a modified power divider axle complete with parallel shaft gearbox and pressurized oil system.

“The secret for long life is a pressure-tube cooling system,” Wallace says. “Semi tractors have huge radiators, which is great for running a pto — lots of cooling. You can idle a large semi engine down and change gears in the transmission and use a third less fuel than a tractor.”

His truck is equipped with a vacuum switch so he can drive it where he needs to go, then flip that switch to disconnect traction drive when he wants to run the pto. He hits cruise control to set the speed he wants.

Wallace put the axle on one of his trucks to run a bagger machine. He and his son-in-law run a self-propelled forage harvester for their custom harvesting business. A lot of time was wasted arranging to get the tractor to run the bagger. Adding a pto to a truck makes the bagging operation self-sufficient.

“Instead of using a \$200,000 tractor to run pto-driven equipment, why not look for an older semi tractor and put our axle on it?” Wallace asks, noting that his customers have put a truck and axle together for as little as \$12,000. It can then be used for a variety of jobs: running grain vacuums, manure pumps, silage blowers, hay tubs and even generators. One customer picks up 250,000 bushels of seed beans from different farmers with a grain vac, and with his semi pto knows he won't have to worry about tractors not starting on cold days. Another customer plans to grind corn.

Wallace sells his smallest horsepower axle,



Harry Wallace has figured out a relatively inexpensive way to add 250 to 1,000 hp pto's to semi tractors, using an add-on axle pto.



Semi pto can be used for a variety of jobs including operating grain vacuums, manure pumps, silage blowers, hay tubs and even generators.

rated at 180 hp, for \$4,800. The 250-hp rated version sells for \$6,800. He has gone through design planning with gearbox engineers to achieve up to 1,000 hp.

“You can buy a cheap truck and get quality power,” Wallace says. The truck power could be used in emergency situations, such as pumping water in flooded regions, or powering generators when there is no electricity.

He plans to sell do-it-yourself plans for \$15 on www.GizmoPlans.com (by Nov. 1st).

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