BUILDING AN OPTIMAL AND SECURE WOOD-STOVE

Photo: Lotus Wood stove

In this post I continue my reflexion of the design of a range of "open source" in which all (and indeed some have already sent me mail their designs and tips) can participate and improve.

When designing a wood burning stove in the optimal fuel consumption and comfortable, we have several options, depending on how we want to extract the heat.

To do this we use the latest techniques and materials; First I'll build a simple stove that anyone can do only with refractory bricks, refractory cement and a fan (optional for better performance), to then make a more complex and automated fire control, accumulator wood to make it even more comfortable and autonomous.

I will follow the following principles:

- The safest and cheapest way to store heat is by refractory bricks or sand.
- The more efficient combustion requires high temperatures, a second injection of preheated air before the gas outlet.
- If we want to keep the stove in low dimensions (not everyone has as much room to fit a large Russian stove), we have two options; extract heat or with a water exchanger that allows to take the heat to a tank or other rooms (dangerous on the other hand, we must control temperature, pressure, circulator motors, etc), or if you just heat a home with option of bringing hot air ducts, can extract standing metal plates as exchanger and a fan draw heat.
- Trying to find the simplest possible, and accessible to everyone design will use refractory bricks, which have the advantage of accumulating heat is slowly released (like Russian stoves).
- Another option is the plate vermiculite , further isolating the bricks and the main advantage of being lighter and easier to transport.
- For greater control and efficiency, I can control shot exhaust (which security will never fully close the shot) and fire control also input (when it is turned off, preventing the accumulated heat go up the chimney).

In principle be manual, to subsequently add a Arduino to control the shots, combustion gases outlet temperature, etc.

- To achieve the dual combustion air preheat practicing rock vidia holes in the bricks as we place, the air circulating among the most exposed to heat to ensure they reach high temperatures to ignite some fire bricks. For me it is the most durable and efficient system available.
- When designing a stove for high performance and simple that we remove all the heat from the fumes out after proper combustion, we lose much of the shot that provides the heat of the smoke, so that one performance stoves fume extraction system or introducing air by mechanical processes (fans or extractors) is almost indispensable, especially when the whole has not reached the proper temperature (at the start of ignition). This can also be solved with a system of direct vent until you get to that point (with the possible problems of maintenance of all mechanical system).
- In the secondary combustion zone where cooler air inject preheated forced to place a smoke twist to ensure proper mixing.
- I will try to focus on design for low cost and simple RIEF then applying improvements that will enhance their autonomy and automatic operation.
- To make it easily transportable, I will add strong wheels in a metal housing, and a large ash drawer.

- The design is scalable; we can build it to the size of our needs.
- As at first he did not take water or prone to explode circuits;-), will not require large securities.
- My goal is also the final range is adjustable (with an air exchanger and a water which can be added a posteriori), so that we can regulate the heat emitted into the room where the stove is and hot water or heating .
- I will try to measure consumption and efficiency with a Testo measuring, looking for the most efficient and simple in design.

Source: http://crecimiento-sostenible.blogspot.in/2014/11/building-optimal-and-secure-wood-stove.html