

SNV Fish Smoker – Morrison Stove Retrofit

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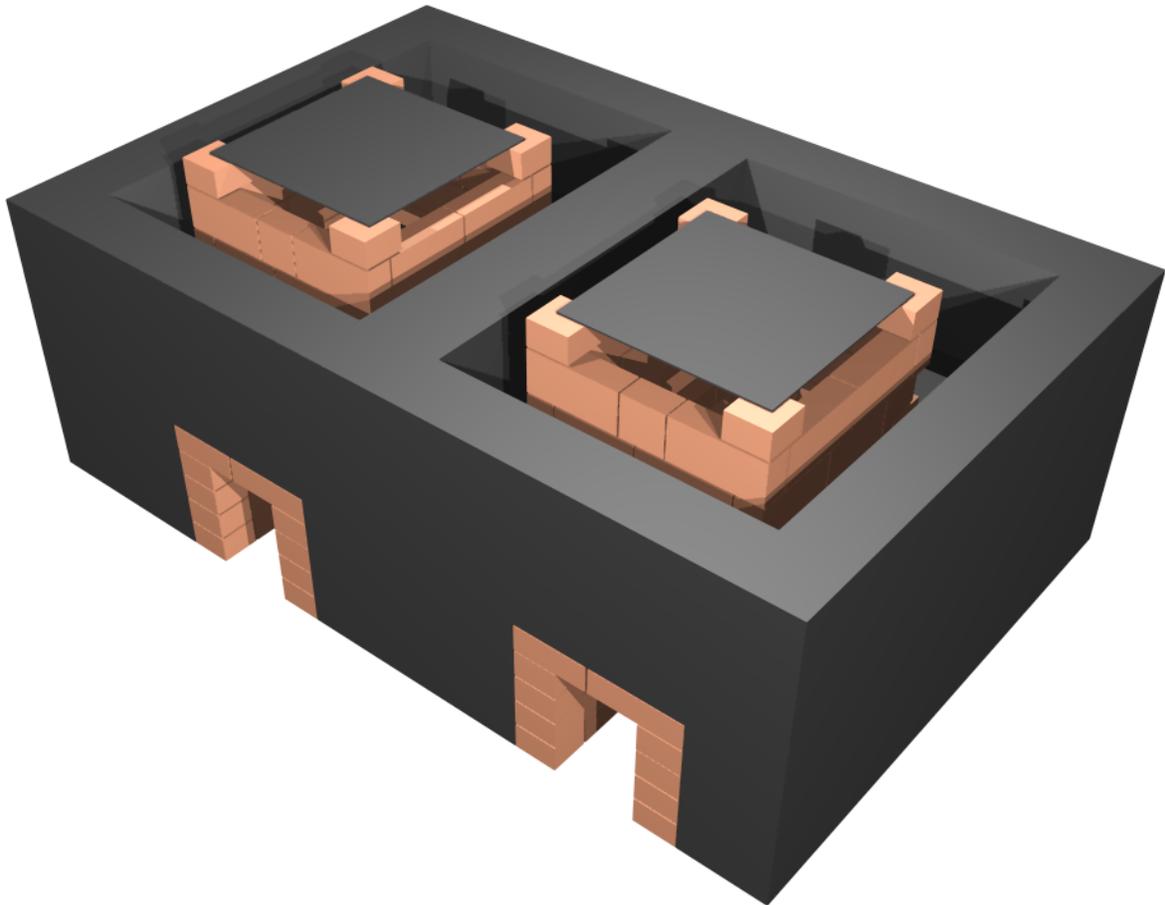
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General approach

This retrofit involves opening a new hole in the front and patching the existing fire hole. It requires a new hold made through the back wall to admit air and to help clean out the ash that falls through the grate.

The combustor is basically the same as the Version 0.4 and 0.5 (the DownDraft models). The upper portion of it is shorter and diverts the fire to the left as it enters the air mixing chamber.

View 1



The walls shown are the standard height of 771mm. On top of the combustor sits a metal plate 475 x 475mm with a thickness of 2mm or more. It may require holes in it to provide some heat to the centre of the plate, however this must only comprise a small percentage of the total air flow.

The plate rests loose on the four supports. It might be changed to a larger dimension such as 475 x 625 to push the hot gases towards the ends of the chamber.

The top course of 4 bricks are 100mm square and serve to create an exhaust path for the hot air. The height of the supports should be 50mm or more. A brick is suitable (63mm) but the extra 13mm of height is not required.

The next course is **optional** and it is not known at this time if it is required. It is preferred to build the unit as shown and test it. This will require raising the entire working deck enough to lift the bottom tray above the metal plate, preferable by 75mm or so. If the system works well (with the addition of holes in the plate as needed) then the second course of bricks can be removed to see if it still works. The volume contained in the second-from-top course of bricks on their side provides a mixing space for air and hot gases.

The back section is for air entry only and has a cap of 30mm thick cast concrete measuring 520 x 360mm. This cap does not get very hot.

Wooden frame

The latest Morrison Stove includes a built-in wooden frame. This is not shown on the drawing and should be fitted as necessary and appropriate.

Fish oil dripping

It is well known that the roasting of the fish oil dripping from the product onto the hot parts of the stove creates PAH. The operating temperature of the lower chamber is significantly reduced by this design, save the metal plate which may or may not be cooled sufficiently in the air mixing chamber. It is expected that with the greatly reduced operating temperature the formation of PAH from dripping oil may be significantly reduced. It should be tested to see if this is the case. A drip tray is to be avoided if this change removes most of the PAH problem. If a drip tray has to be installed, the gap between the plate and the product (lowest tray) must be increased to as to all hot air to get under the lowest tray, remembering that without perforations, the centre will be difficult to heat evenly.

Metal plate

The plate is shown without any perforations because they may not be necessary, and if they are, we do it will have to be determined by experiment where to put them and how big they should be. At this time I am inclined to recommend that the holes be made with a cutting disk (angle grinder) which would make them 3mm wide and about 150mm long. The number and position is to be determined by examining the dried product.

Drawings
Combustor:

