

Mr Charcoal

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Good luck,

Jeff



Abstract: An exploration of a large scale Top Lite Up Draft (TLUD), fabricated from a recycled hot water tank heater.

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Fabrication: One recycled dura-HOT hot water tank heater, gas fueled, was acquired for this project. As much of the outer shell and insulation was left intact as possible to provide insulation for the device and protection for the operator. The outer shell top was removed and a hole was cut in the top of the tank. This round tank material cut from the tank was used as the grates after three short metal rods were welded to it for feet so that the make shift grate would stand above the air inlet. I could not find any



Photo 3



Photo 2

pictures of this feature in my files.

One problem when using a gas fueled water tank heater, as opposed to an electric hot water tank heater, is that the flue pipe has to be cut out of the top and bottom. Therefore the outer bottom shell has to be removed in order to gain access and then replaced also the bottom of the tank needs to be patched were the flue pipe was removed.

Hot water tank heaters have one serious problem when using a cutting torch or a welder on them. The problem being that the inside has some kind of coating that produces nasty fumes. Take all safety precaution possible and then some!



Next a pipe was welded at the location shown in photo 2. This pipe was use with an electric air blower to supply primary air. A speed control was used in conjunction with the blower in order to control the air feed. There was no attempt to supply secondary air, via the blower, but this feature should be integrated into the next version. Even with the outer shell it's best to use a nice length of pipe in order to distance the motor from the reactor. The flue pipe is of nice quality and could possibly be used here if a gas fueled hot water tank heater is used.

Operation: If this unit is only used as a burner or incinerator then no lid is needed but if charcoal production is desired an air tight lid is a must. Furthermore the air inlet will need to be capped. I used the bottom of a 55 gallon drum to seal the top



Photo 4



Photo 5

as can be seen in photo 5. This is not air tight so charcoal production was poor especially switch grass charcoal. For this reason no attempt was made to measure charcoal percentage production. See photo 6 for a small sample of the switch grass charcoal produced. This was not the amount produced per run but just a sample.

As far as a burner it did an OK job, defiantly put out some serious heat. Fuels like branches, chunk wood, wood chips, switch grass and house trash were all used.

Expunging the ash or charcoal became a problem due to the weight of the unit. It was simply tipped over and the contents shoveled out along with the grates. It was too heavy to pick up the bottom, after being tipped over, and dump the contents out at an angle on a regular basis. In a relatively short time this constant tipping over heavily damaged the outer

shell and insulation. The trick to replacing the grates was to use two lengths of heavy wire with a J bent at the end to hook on to the grates and lower them down into the unit so that they didn't end up tipped



over thus out of place.

Possible Improvements: If charcoal is desired an air tight lid could be produced with a water seal design of some sort.

Forced secondary air supply is a possibility. I'm not sure if preheating the secondary air would be worth the complication.

During fabrication it might be worth the time investment to carefully remove the outer shell then make the modification then reassemble the outer shell.

One possible solution to expunging the charcoal would be to weld two round objects to the tank near the center of gravity that would provide a pivot point. Next a frame to suspend the unit at this pivot point and then like a cement mixer the unit could be dumped with the aid of a handle of course.



Photo 6