RICE HUSK QUASI GASIFIER STOVE WITH SIDE-IN STEAM INJECTOR

by

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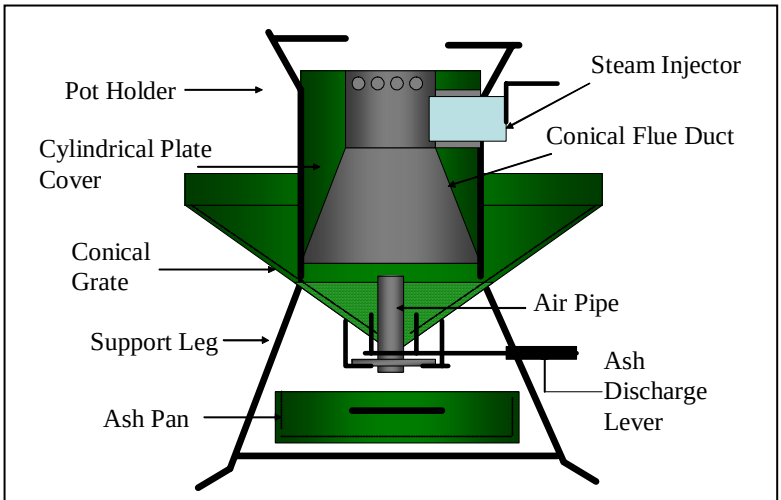
Good news to households! Cooking using the traditional rice husk stove can now be done with improved operation by steam injection. The rice husk quasi gasifier stove is a semi gasifier cooking device that adopts the steam injection technology on cookstove of Mr. Hao Zhengyl of Kunming City, China with the existing conical grate rice husk stove. With rice husk quasi gasifier stove, an improved flame for cooking can be obtained from burning rice husk.



Schematic Drawing of the Rice Husk Quasi Gasifier Stove with Side In Steam Injector

The rice husk quasi gasifier stove is another technology developed at the Appropriate Technology Center, College of Agriculture, Central Philippine University, Iloilo City with the assistance from the group of agricultural engineering students Daniel Belonio, Lucio Larano, and Raymund Paul Aungon. The stove, as schematically shown, consists of a conical grate in inverted position having a grate area of 0.04 m^2, a cylindrical plate cover having a dimension of 0.2 m diameter by 28 cm high, a conical and cylindrical flue duct that receives burning gases and directs it to the pot, a secondary air pipe that is centrally located in the grate, an ash discharge lever to remove burnt rice husk during operation, a pan to collect ashes that is falling from the grate, a support stand, and a pot holder. Steam is injected at the side of the cylindrical cover through the cylindrical flue duct that is located above the conical duct. By injecting steam, a more improved flame is generated during the burning of gases.

Performance testing and evaluation showed that the fuel in the stove can be ignited in less than a minute using 1 to 2 pieces of paper. It consumes an average of 2.4 kg of rice husks per hour and can boil 2 liters of water within 14 to 18 min. The amount of steam used during operation averages to 0.46 liter per hour with fuel to steam ratio of 5.6. The computed burning rate of the stove was 59 kg/hr-m^2. Thermal efficiency using boiling and simmering tests was determined at about 11 percent. The percentage char/ash produced after each operation is 26 percent. The computed power output of the stove is 1 kW. Cooking a kilogram of rice with 1 liter of water will require a time of 18 minutes. Using 2 kg of rice with 2.9 liters of water will take 28 minutes of cooking.

The stove is simple and easy to operate. It can be considered as a clean combustion technology for domestic cooking utilizing rice husks as fuel. It can be fabricated using local materials and skills. The total cost to produce the stove (materials, labor plus overhead) is P1,500.00 per unit (1US$ = PHP52).

Further development on center steam injection through the secondary air pipe and cylindrical plate cover are presently undertaken. Any interested organization who wishes to adopt the technology may collaborate with the Appropriate Technology Center, Department of Agricultural Engineering and Environmental Management, College of Agriculture, Central Philippine University, Iloilo City, Philippines. You may contact through our landline at 063-033-3291971 loc 1071 or our mobile phone at 063-09167115222.

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