

RICE HUSK GAS BURNER FOR BAKERY OVEN

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Good news to bakers! Instead of spending hundreds of pesos for LPG, you will now only spend less for your baking!

A rice husk gas burner for bakery oven is now commercially available. This rice-husk-fuelled gas burner significantly reduces the cost of fuel for baking. In this technology, rice husk is gasified inside the reactor and the gas generated is ignited at the burner, which produces luminous bluish flame for heating bakery oven. The gas burner can be conveniently operated as compared with other rice-husk-fuelled ovens. The amount of flame can be uniformly controlled with the use of a switch.

The rice husk gas burner for bakery ovens is another breakthrough in the area of rice husk gasification, which is carried out by the Department of Agricultural Engineering and Environmental Management of the College of Agriculture, Central Philippine University in Iloilo City, Philippines. This technology was developed with the assistance from the group of undergraduate agricultural engineering students Lucio Larano, Daniel Belonio, Yvone Herbo, and Jeffrey Cocjin.



The rice husk gas burner for bakery ovens consists of the following components: (1) Dual Fuel Reactors - where rice husks are gasified during operation by burning them with limited amount of air; (2) Char Chamber – where burnt fuel is discharged from the reactor after gasification; (3) Blower – which supplies the needed amount of air for gasification; (4) Char Lever – which discharges burnt rice husk after gasification; (5) Control Switch – which intensifies or lowers the flame; (6) Gas Pipe – which conveys the gas generated from the reactor to the burner; (7) Chimney – which discharges unwanted gases; and (8) Gas Burner - where the gas is burned.



The fuel reactors have a diameter of 25 cm and a height of 1 meter. They are located outside the baking room for ease of operation. The burners are extended from the reactor to the oven through a pipeline. Operation is being done by dual mode so that continuous firing in the oven can be achieved.



Flammable gases, primarily of carbon monoxide and hydrogen, are produced during operation as the burning fuel moves down the reactor. The by-product after gasification is carbonized rice husk, which is a good material for composting.

The rice husk gas burner supplies energy to two 12-plate ovens simultaneously. One or two minutes is required to start firing the rice husks in the reactor. Once the rice husk are ignited, continuous operation is achieved for 30 to 40 minutes before shifting to the other reactor.



The rice husk gas burner featured in this article is owned by Mr. Gil Cordon, a baker from Jaro, Iloilo City. According to him, he uses LPG fuel for 10 minutes to start-up the oven and after that shifts to the rice husk gas burner until operation is done. He also uses LPG fuel as back up in case of power failure. Both ovens are simultaneously used when baking “Pande leche,” “Pande sal,” and other similar bread. When baking “Mamon” and “Hopia” either one or two ovens LPG back-up is used.

Cost analysis showed that for an investment of P30,000.00 for the rice husk gas burner, the cost of operation is only P16.59 per hour. This amount is significantly lower as compared when using the LPG burner, which is P41.67 per hour. With a difference of P25.08 per hour in operating cost, a yearly savings of P115,562.65 can be realized when using the rice husk gas burner instead of the LPG burner. The payback period was computed at 0.25 year, equivalent to 3 months. The return on investment is 385.21% and the benefit cost ratio is 1.51.

The technology is now in commercialization stage. Interested individuals or organizations who wish to order this baking technology may contact the Project Director, Appropriate Technology Center, Department of Agricultural Engineering and Environmental Management, College of Agriculture, Central Philippine University, Iloilo City, Philippines. Telephone number 063-33-3291971 loc 1071, email ad atbelonio@yahoo.com, and mobile phone 063-0916-7115222.

1 USD = 50 PHP