

RICE HUSK FURNACE FOR RECIRCULATING-TYPE PADDY DRYER

by

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Recirculating-type paddy dryers can now be fueled with a low-cost and easy-to-build rice husk furnace, thus making drying business more profitable.

Good news to rice processors who own a recirculating- type paddy dryer! You can now reduce the cost of drying paddy by switching to a low-cost and easy-to-build rice husk furnace!



The Recirculating-Type Paddy Dryer Retrofitted with Rice Husk Furnace

Mr. Clemente P. Abordo, the owner and manager of the Abordo-Portaje Rice Mill in Janiuay, Iloilo has successfully retrofitted his 6-ton capacity Maruyama recirculating-type dryer to a furnace that uses rice husk as fuel. By using the furnace, the cost of fuel and electricity for drying was heavily reduced to P30.00 from P206.00 per hour when using diesel. For 6-ton drying load, Mr Abordo saves as much as P2,464.00 for 14 hours operation .



The Close-Up View of the Rice Husk Furnace

The rice husk furnace was designed and developed at the Department of Agricultural Engineering and Environmental Management, College of Agriculture, Central Philippine University with the assistance from agricultural engineering students Daniel Belonio, Kristofer John Hornada, Job Cordero, together with Project Assistants Engr. Aries Roda Romallosa and Jane Napawit. This technology won second place during the 5th PCIERRD Regional (Visayas and Mindanao Cluster) S&T Fora and Competition held at DOST Bicutan in 2004.

The furnace is an inclined-grate type that uses ¼-hp 3-in. diameter electric blower to aid in the proper combustion of fuel. The fuel is fed into the hopper that can handle about 2 to 3 sacks of rice husk per load. Feeding of fuel into the combustion chamber is done through a manually operated damper. The furnace has a combustion chamber of 36 cubic feet and burns rice husk at a temperature of about 400 to 700 C. Rice husk consumption is only 3 to 3.5 sacks per hour. Clean hot air is received by the dryer from the furnace using a



The Operation of the Furnace Showing the Burning Rice Husk

fired-tube heat exchanger, which is made of 12 pieces 3-in. diameter by 2-ft high schedule 40 GI pipes. Burning of fuel is regulated by a bellow-type thermostat, which maintains the desired drying temperature for the dryer of 55-80 C. A 12-in. diameter axial fan is used to push the heated air from the heat exchanger to the plenum chamber of the dryer. Burned rice husk, which is in the form of char, are discharged from the furnace through a damper and a screw feeder. Paddy with 26-27 % initial moisture content can be reduced to 14-15% for a period of 14 to 15 hours. At 22 to 24% initial moisture content, the paddy can be dried to 14-15% final moisture within 8 to 9 hours drying.

The furnace was built on-site by Mr. Abordo's two shop welders within a period of one month with a total cost of P160,000.00. Cost analysis showed that the investment cost for the furnace can be recovered in just two and a half months.

Mr Abordo uses the furnace as the source of heat for the dryer and, the rice hull char produced as soil conditioner for his rice farm and additive for his proposed composting business.

Interested rice millers or individuals, who wish to adopt this 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. ☎033-3291971 loc 1071, Email: atbelonio@yahoo.com, Cell: 09167115222.

1 US\$ = 50 PHP