

Evaluation of biomass based combustor for hot air generation using maize cobs

■ D.K. VYAS, S.S. KAPDI, H.D. BHANDERI AND S.V. VARIA

Received : 05.02.2015; Revised : 27.02.2015; Accepted : 10.03.2015

See end of the Paper for
authors' affiliation

Correspondence to :

D.K. VYAS

Department of Renewable
Energy, College of
Agricultural Engineering and
Technology (A.A.U.), GODHRA
(GUJARAT) INDIA
Email : dhano810@yahoo.com

■ **ABSTRACT** : Agriculture and energy have always been tied by close links, but the nature and strength of the relationship have changed over time. Biomass is considered as a renewable source of energy, because it is renewable in nature unlike fossil fuel like coal, oil and natural gas. Biomass is the third primary energy sources after coal and oil, accounting for about 14 per cent of the world's total energy supply. A biomass based combustor was developed and evaluated to meet the heat requirements for thermal application (drying, cooking, etc.) and power application through turbo charging. The biomass based combustor consists of combustion chamber, heat exchanger, chimney, hot air outlet and ambient air inlet, fuel hopper, primary air inlet with control, grate for proper combustion of the combustible gas. The developed biomass combustor was tested with maize cobs, three air flow rate and five fuel consumption rate. The experimental investigations show that the maximum efficiency of biomass combustor using maize cobs was 66.97 per cent in case of 1 kg/h fuel consumption rate and 400 m³/h air flow rate. The hot air temperature varied in between 51.55 to 142.35°C at three air flow rates *i.e.* 200, 300 and 400 m³/h and five fuel consumption rate *i.e.* 1 to 5 kg/h using maize cob as a fuel in the system.

■ **KEY WORDS** : Biomass, Combustion, Biomass combustor, Overall thermal efficiency, Hot air temperature

■ **HOW TO CITE THIS PAPER** : Vyas, D.K., Kapdi, S.S., Bhanderi, H.D. and Varia, S.V. (2015). Evaluation of biomass based combustor for hot air generation using maize cobs. *Internat. J. Agric. Engg.*, 8(1) : 79-84.