



31st January 2013

Managing Director
Spectra industries
Maspotha
Kurunegala

Dear Sir

Performance evaluation of Spectra Biomass Boiler

Performance of the spectra biomass boiler was tested and the calculations and findings are given in the Annexure. It is evident that compared to the other heating options such as electricity and LP gas, spectra biomass offers cost effective operation. Moreover we recommend you to further improve the design to facilitate easy maintenance of the boiler.

Yours faithfully


M.M.R. Pathmasiri
Director (Energy Management)

1. Introduction

Spectra industries, Maspotha Kurunegala has developed a biomass hot water generator for small scale applications such as restaurants, hospitals etc. and performance test has been carried out by Sri Lanka Sustainable Energy Authority and the results are given below.

2. Results

2.1 Type/s of biomass used

Firewood		
Moisture content	-	20%
Size		
Diameter	-	3" to 4"
Length	-	4" to 6"

2.2 Test results

Amount of water heated	-	70 Liters
Biomass consumption	-	2.5 kg
Initial temperature of the water-		27 °C
Final temperature	-	100 °C
Heating time	-	20 minutes

2.3 Performance evaluation

Energy content in the firewood	-	37 MJ
Energy taken for water heating	-	24.5 MJ
Thermal efficiency of the unit	-	58%

2.4 Economic evaluation

Energy requirement for heating up 70 liters of water up to 100 °C with respect to the different technologies are give in the following table.

Technology	Source of energy	Plant efficiency %	Energy consumption	Cost of energy - LKR
Water boiler	Electricity	95	6.3 Units	113.00
Gas cooker	LPG	65	0.7 kg	140.00
Spectra biomass boiler	Firewood	58	2.5 kg	25.00

Unit cost of electricity - LKR. 18.00

Cost of 1kg of LPG - LKR. 200.00

Cost of 1kg of firewood - LKR. 10.00