

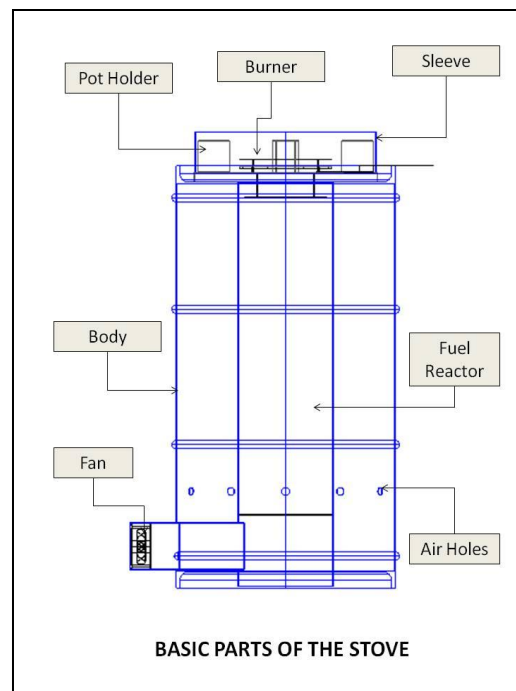
A SUPER LOW-COST BLUE-FLAME RICE HUSK GAS STOVE

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Good news and glory to God!

A super low-cost, blue-flame rice husk gas stove was recently developed in Indonesia to provide households with an affordable clean-burning cooking device using rice husks as fuel. Within the 3 years of development on rice husk gasifier stove, PT Minang Jordanindo Approtech has finally come up with the super low-cost, blue-flame rice husk gas stove carrying a selling price of US\$10 to 15, which is very much cheaper as compared with the previous model with a selling price of US\$20. With this development, consumers don't need to amortize for the stove, as what is currently practiced in villages in Indonesia, for them to acquire a unit of the stove in order for them to save money on fuel. Moreover, this stove is now made available to end users at a low cost, freeing the distributors from the task of devising financing schemes just to make the technology affordable to the local households.

As shown, the stove consists of only few parts. It was designed and made so simple to maximize the use of materials and to simplify the production using locally available resources. This stove model has the following basic parts: (a) the casing is made of tin can and can be bought at a very low price from a Can Factory; (b) the reactor can be subcontracted from a sheet metal manufacturer as well as the stove cover



and the burner; (c) the fan, which uses DC 12 volt, 2 watt supplies the required air to gasify rice husks. The flame coming out of the burner is bluish in color, which indicates a very clean gas. It has low black carbon emission of about 50 ug/m^3 and below. The CO_2 emission is about 0.6 kg CO_2 per kg rice husks.

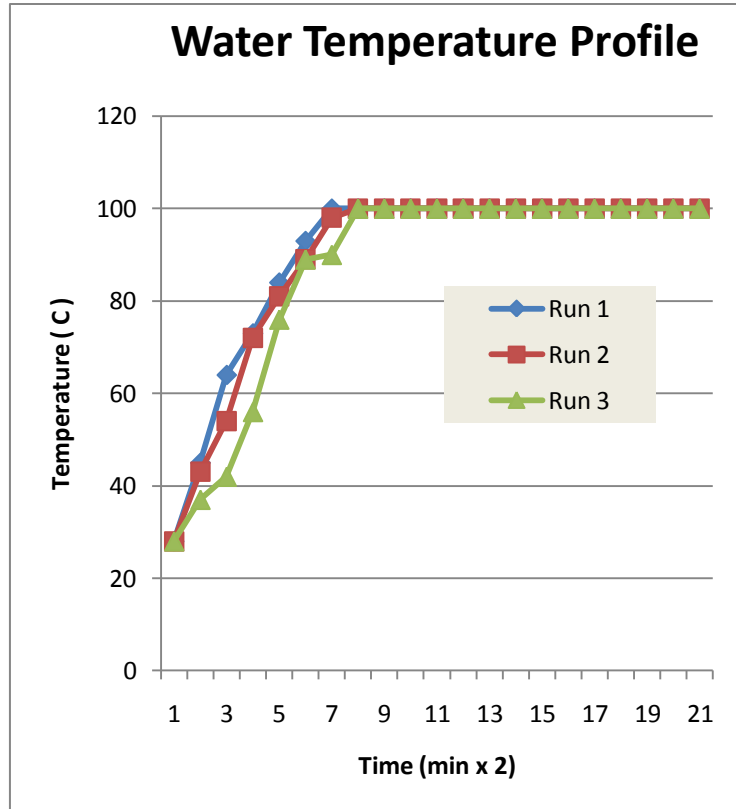


Results of the performance testing and evaluation

using a water boiling test showed that the stove consumes 400 grams of fuel per load. It is able to produce combustible gases in just a minute from the time of fuel ignition. Moreover, one and a half liters of water can be boiled within 13 minutes. The figure in the right side shows the

temperature profile of boiling water in the stove. One full load of fuel can last 18 to 25 minutes of cooking.

Reloading of rice husk fuel in this stove is conveniently easy. The specific gasification rate of the stove is 72 kg/hr-m^2 with a fire zone rate of about 2.2 cm per minute. Furthermore, it has a thermal efficiency, which is the amount of heat derived from boiling and evaporating the water over the heat energy from fuel, of 20.2%. The computed power input and output is 4.56 and 0.96 kW_t , respectively. The



temperature at the bottom of the pot which was measured using type K thermocouple wire sensor, varies from 210 to 320°C.

The intensity of the flame can be made wide-ranging using a calculator adaptor by changing its voltage input. In case of power failure, the stove is made adaptable to either a 9-volt rechargeable dry cell or a sealed lead acid battery from motorbike or from automobile. The use of thermoelectric chip can also be adopted for the stove, if needed.

The stove investment cost is only \$10 to 15 per unit FOB Jakarta, Indonesia. In the users' perspective, payback period for the stove is within a month as compared with kerosene or LPG stoves. A CO₂ saving of 0.40 and 0.27 ton per year can be derived from the use of the stove against the use of kerosene and LPG fuel, respectively.

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Released: February 2010