

# COCOPEAT PELLET GAS STOVE

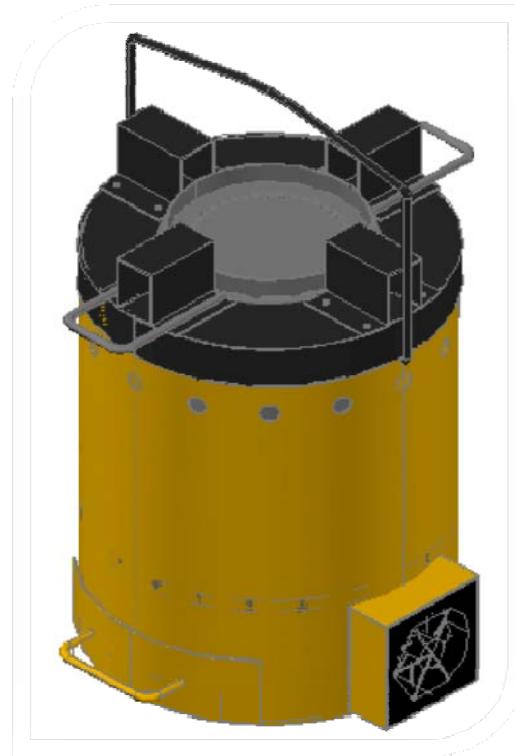
by

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Good news! Cocopeat, which is one of the difficult-to-dispose biomass wastes, can be used as fuel for domestic cooking. With the annual production of about 14 billion nuts of coconut in the country, an estimated amount of 2.8 million metric tons of cocopeat is produced.

Pelletizing cocopeat and gasifying it in a Top-Lit Up-Draft (TLUD) type gasifier stove, this waste can now be used as fuel for domestic cooking. This coco-pellet gasifier stove technology is another output of the research and development effort of the CPU Appropriate Technology Center of the College of Agriculture, Central Philippine University, Iloilo City, Philippines with the assistance from the following agricultural engineering students Job Cordero, Jojie Garcia, Lucio Larano, and Ruel Hamor. This gas stove was developed with the aim of providing domestic households another low cost technology for cooking using biomass waste as fuel. By using limited amount of air injected into fuel, a combustible gaseous fuel is produced consisting of CO, H<sub>2</sub>, and CH<sub>4</sub>. However, because of high amount of volatile matter in cocopeat, the burning gas produces a yellow-to-pink flame.

The stove, as shown at the right photos, is a TLUD type gas stove consisting of the following components: (a) Body, (b) Inner Shell, (c) Outer Shell, (d) Grate, (e) Cover, (f) Burner, (g) Ash Pan, and (h) Fan. The body is used to enclose the entire parts of the stove. It has a diameter of 24 cm and a height of 30 cm. It is made of GI sheet no. 18 and is fabricated in a small welding shop. The inner and outer shells of the stove are made of stainless steel sheet having a diameter of 10 cm and 11 cm, respectively. It is where the pellets are gasified



during operation. Beneath the inner cylinder is a grate that holds the fuel while being gasified. Small computer 12-DC fan is used to supply the air needed for gasification. The cover, where the four support stands is in place, holds the pot during cooking. The plate-type burner burns the gas emitted from the reactor. It is designed to be removable to allow easy reloading of pellets for continuous operation.

The advantage features of the stove are: (1) Cocopeat, a biomass waste which is difficult to burn, can now be utilized as fuel for the stove; (2) Almost no smoke is observed during operation; (3) It is portable enough that can be carried and moved to any desired place for convenient cooking; (4) The intensity of flame can be controlled by means of adjusting the gap of the ash pan or by shifting the input voltage; (5) Operation can be done continuously as desired using the removable burner; (6) It can be energized using AC or DC power source; and (7) The costs of the unit and of the operation are affordable to users.

Performance evaluation of the stove revealed that cocopeat pellets can be successfully fueled in the stove by gasification in a continuous mode. Gas can be generated within a minute after igniting the fuel. One liter of water can be boiled within 11 to 15 minutes using pelleted fuel at a rate of 10 grams per minute. Flame temperature measured beneath the pot varies from 400 to 421°C. Specific gasification rate was computed at  $77 \text{ kg/hr-m}^2$ .

The stove costs between P500 to 1500 (US\$1 = PHP42 = IDR9200), depending on the kind of materials and fabrication technique used. Investment can be recovered within a year.

For further details about the technology, contact: The Project Director, Appropriate Technology Center, Central Philippine University, Iloilo City, Philippines (email:cpu\_aprotech@yahoo.com). Local inquiries regarding the product, please contact Mr. Reynaldo Go, REGWILL Industries, Inc (email:regwillcocotech@yahoo.com). In Indonesia, please contact Mr. Djoewito Atmowidjojo, President Director, PT Minang Jordanindo Approtech (email:mjaprotech@yahoo.com).

