COMPRESSIVE STRENGTH OF BIOBRICKS

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ABSTRACT

In this paper Briquettes making process is designed. Biomass briquettes generally made of agricultural waste and commonly used for electricity generation, cooking food and keeping warm. These compressed compounds contain various organic materials including rice husk, bagasse, groundnut shells, cotton stalks, husk of soya bean and agricultural waste, they are the less carbon emission. These agricultural wastes are brought together and press by rotating screw and form briquette in order to burn longer and transportation of goods easier. This biomass briquettes are different from coal it has much lower ash content than coal.

Key Words: Briquette, agricultural waste, rural development.

INTRODUCTION

Briquettes are used as a alternative source of energy. Briquette made from waste material such as rice husk, bagasse, groundnut shells, cotton stalks and husk of soya bean and agricultural waste they are the less carbon emission. In India as well as foreign countries many of companies switched from fossil fuels to briquettes machine project to get eco-friendly bio fuel and also to save our environment from pollution and CO2 emission.

The raw material combined and compressed into briquette in order to burn longer and makes the transportation of goods easier. Briquettes are inexpensive than coal. There is no fly ash when burning briquettes and have high burning efficiency. It is renewable energy source that make better our surroundings or environment and therefore it is presumed as energy source in many countries like India, Indonesia, Brazil, etc . In many developing countries with increasing population the amount of agricultural wastage also increased.

These wastages get decompose and burnt due to this the smoke of the wastage cause air pollution. So to avoid this issue biomass briquette is an another way of using agricultural waste. It is not proper way to burn biomass waste directly in domestic (cooking, heating) as well as industry applications (agro industries, food processing).

II. OBJECTIVE

- To fabricate a low-cost portable briquetting production for rural use.
- The waste biomass like dry leaves, sawdust, rice husk, coffee husk etc.. are gathered and compressed into briquettes , these briquettes can also be transported and used as fuel to generate heat.
- To decrease the volume of shredded waste and thereby reducing the cost and fuel required in disposal process.

III. Preparation of Product

1: Raw Material with different calorific values:

Agricultural Waste	Cal/kg	Ash Content
Bagasse	4700 K	1.80%
Babool wood	4707 K	0.90%
Rice husks	3200 K	22.20%
Cotton stalks	4200 K	3.01%
Groundnut shell	4500 K	3.80%
Soya bean husks	4170 K	4.10%
Sugarcane waste	3700 K	10%

Table 01: Raw materials with different calorific values

2.Agricultural waste in India:

After China, India is the second biggest maker of agricultural waste. It creates in excess of 130 million tons of Paddy straw out of which just half is utilized as feed and the other half goes to squander, either in landfills or is basically unloaded somewhere. It likewise delivers in excess of 50 million-tons of stick bagasse. The excess waste (84-141 million-tons) is typically singed by the ranchers which brings about enormous air contamination causing significant wellbeing perils. A review in light of Punjab alone showed that stubble delivered per section of land of paddy and wheat is around 23 and 19 quintals individually. Around 85% of the paddy stubble is scorched in the open field. On account of wheat stubble around 11% was singed, considering how much stubble being created, in any event, consuming a more modest level of it can make significant harm the climate around it.

3: Process of Briquette Production:

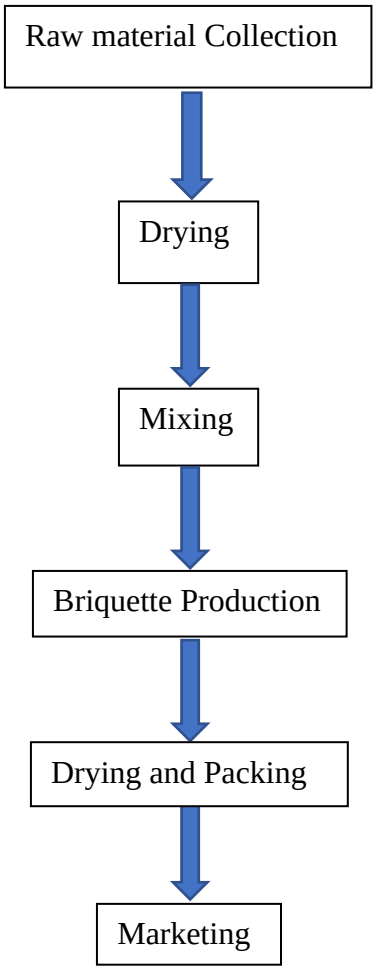

Fig 1: Briquetting process

In briquette production collects the raw material like bagasse, babool wood, Sugarcane waste etc. After collection of raw material, it is required to dry it. It requires to grind it properly in small size. The grinded Material mixed in proper amount of water for two days, because it is necessary to proper involution of grinded materials and water. After two days the material will be ready to produce the briquette. The produced briquette will be dry in sun completely. These briquettes are widely used for thermal application like boilers, furnace and foundries. For heating purpose like residential and commercial heating for winter, household applications, hotels, canteens, etc.

Fig 2: Produced briquette

IV: Experimentation:

After making the briquette calculate the whole dimension like briquette length, width, hight, their weight etc. After that calculate the Compressive Strength of briquette in Universal Testing Machine in KN.

Fig 3: Checking Compressive strength of briquette on UTM machine

V. RESULT

Making three different types of briquettes like Bagasse, Babool Wood and Sugarcane Waste by using UTM machine applying the load and calculate the Compressive Strength.

$$F = \frac{P}{A}$$

Where: F = The Compressive Strength

P = Maximum Load to the material (N)

A = A cross section of the area of the material resisting the load (mm^2)
(The cross-section area of all the briquettes is 2500mm^2)

KN= 1000 N

Fig 4: Briquette after applying the load

Sr. No	Briquette Type	Load (KN)	Compressive Strength (N/mm^2)
01	Bagasse	10.20	4.08
02	Babool Wood	15.40	6.60
03	Sugarcane Waste	6.30	2.52

Table 02: Compressive Strength of briquettes

VI. CONCLUSION

From Compressive test it is found that for bagasse it is 4.08 N/mm², for babool wood it is 6.60 N/mm² and for sugarcane waste it is 2.52 N/mm². It is observed that babool wood briquette has more strength.

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