

BRIQUETTING PROCESS

(What we know VS What we Don't know)

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Introduction

- The briquetting technology is new in African nations, but advanced in Asia, America, and Europe. In such advanced nations, successes have been recorded in the production and utilization of briquettes, but the same cannot be said in most developing countries. However more recently the briquette technology is being appreciated in the north eastern Nigeria, Specifically Adamawa, Borno, Bauchi, Taraba and Yobe as an alternative to Safe access to fuel and energy .
- Briquettes can be Carbonized and the Non-Carbonized. They come in different sizes and shapes that are used for heating and cooking



Calorific Values of Various Raw Materials

Raw Material	Calorific value - Kcal/Kg	Ash %
Groundnut Shell	4500	3.80 %
Bagasse	4700	1.80 %
Castor Seed Shells	3860	8.00 %
Saw Dust	4400	1.20 %
Cotton Stalks / Chips	4200	3.01 %
Bamboo Dust	3700	8.00 %
Babul Wood	4707	0.90 %
Coffee Husk	4200	5.30 %
Tobacco Waste	1100	49.40 %
Tea Waste	4000	6.70 %
Paddy Straw	3469	15.50 %
Mustard Stalk	4200	3.40 %
Mustard Shell	4300	3.70 %
Wheat Straw	4000	8.00 %
Sunflower Stalk	4300	4.30 %
Jute Waste	4800	3.00 %
Palm Husk	3900	4.90 %
Soya bean Husk	3700	4.10 %
Sugarcane Waste	3900	10.0 0%
Barks Wood	3000	4.40 %
Forestry Waste	4170	7.00 %
Coir Pitch	4146	13.60 %
Rice Husks	3200	22.20 %
Wood Chips	4300	1.20 %

What we know VS What we Don't know

- Material
- Process
- Usage

What we know

- Agricultural wastes burn so rapidly that it is difficult to maintain a steady fire due to difficulty in controlling the combustion process. Also, wastes do not fit in form and structure for traditional coal pots and stoves.
- Direct burning of loose bulky agricultural wastes is inefficient. They have low energy value per volume and hence are uneconomical; they also cause problems for collection, transportation, storage, and handling.
- Carbonized biomass needs to be mixed with binder when making briquettes, because when a residue lacks the natural lignin that helps in bonding (or the percentage of lignin is low) the introduction of a binder will be necessary to improve briquette quality.
- Briquettes are solid fuel used for cooking at household, commercial level or industrial level as the case may be.
- The desired qualities for briquettes as fuel include good combustion, stability and durability in storage and in handling (including transportation), and safety to the environment when combusted.
- Level of acceptability is based on the briquette properties, how these are measured include the energy value, moisture content, ash content, density or relaxed density, strength, ease of ignition, smoke and emissions.

What we don't know

- Briquettes from different materials or processes differ in handling and combustion behavior; briquettes from same material under different conditions can have different qualities or characteristics
- The particle size of the material could have an effect on the resulting briquette density and compressive strength
- Appropriate selection and amount of binder need to be made in order to prevent smoke, or emission of volatile material that negatively impacts humans and the environment. Some examples of materials with natural binder include cotton stalk, saw dust, corn stalk, among others
- Briquettes with low compressive strength may be unable to withstand stress in handling, e.g. loading and unloading during transfer or transportation
- Stability and durability of briquettes also depend on storage conditions. Storing briquettes in high humid conditions may lead to briquettes absorbing moisture, disintegrating and subsequently crumbling. This disintegration is sometimes referred to as relaxation characteristics

Cont.. ; What we don't know

- During carbonization process, most of the lignin that can act as natural binder are already decomposed when the temperature of the material to be briquetted is elevated (preheat) beyond the natural state, a low pressure would be required for densification
- Applied pressure influences briquette density; the higher the density, the higher the calorific value in kJ/kg.
- Increase in density, however, reduces ease of ignition (i.e. pre-combustion) of the solid fuel; increasing density reduces porosity
- The central hole incorporated into the briquettes produced by a screw extruder, rods pipes etc helps to achieve uniform and efficient combustion and, also, these briquettes can be carbonized.
- Briquette helps in getting rid of insects

CONCLUSION

As pioneers in briquetting technology in Nigeria it is our collective responsibility to correct the anomaly in briquetting process, so that the end user doesn't get discouraged from the very first trial of using the technology. Furthermore, briquetting process may be responsible for briquette relaxation (disintegration and crumbling)

*THANK
YOU*



It is very important to locate the Production site close to Raw Material