

## **Failure analysis of collar of Biomass Briquetting Machine: A Review**

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### **Abstract**

The present review provides brief information about the briquetting machine and their one of the part COLLAR. Briquette machine is used to produced briquette. Briquette is one of the biomass product which is widely used in a boiler for a burning purpose. Briquette is a solid biomass product. Due to solidification of biomass it achieve a better quality of combustion and also it facilitate storage and transportation of biomass. The various method is used to solidify the biomass. These are discuss in various paper. This paper give the brief description of solidification of biomass or briquette by briquetting machine and also discuss about the various part of briquetting machine especially COLLAR.

**Keyword:** Biomass; Briquette; Briquette machine; collar ; solidification.

### **1. Introduction**

Biomass is an environment friendly, clean, cheap and versatile fuel. Biomass produced from organic compound such as agricultural residues (husks, cob, stalks, leaves, stems, shells, sticks). Also waste from bi-product industries like sawmills, plywood industries, furniture factories. Biomass also made from anaerobic digestion of degradable waste such as cattle dung, vegetables waste, municipal solid waste, sewage water land fill etc. for producing various biomass product used various technique and machine. we will study one of the machine known as Briquette machine. Briquette machine produced solid Briquette which is used for substitute of coal. Briquette machine have various component such as Ram, Coller, Taper die, Split die, and Extruder, Screw conveyor etc.

The briquetting press is a reciprocal crank type mechanical press with flywheel. One flywheel is driven by the main motor through continuous flat belt. Forced lubrication oil circulating system guaranties a long service life. The ground material is fed through a hopper by means of a screw conveyer with its own geared motor. The vertical screw pre compresses and forces the material downwards in to the feeding chamber. From the chamber the materials forced by the ram through a tapered die system on to the cooling track in the form of briquettes.

Material has high moisture content needs to be dried either by sun drying or using separate flash drier(optional). The raw materials then mix as per convenient. The mixed raw material has fed to vertical screw conveyer. The conveyer has taken the material to chamber of briquetting press. Then the material is compressed by the press by forcing it through the die with tapered bore. The compression raises the temperature of material, and binds the material together. Briquettes formed are cylinder shape. Which are pushed through cooling tracks under slight pressure for cooling and transport to packing point, where the briquettes are packed and stored for dispatch. The diagram of briquette machine is as follows.



Fig Biomass briquetting System

### **2. Discussion of various part**

It include various part. The main part is as follows.

**Screw conveyor:-** it is used to carry the raw biomass from storage place to hopper. It is also used to mix the moisture socking agent from the raw biomass.

**Hopper :-** Hopper is use to move the raw material from screw conveyor to processing place. It include extruder which is used to give a motion to raw biomass only in a one direction. It is also called as positive direction.

**Ram :-** ram is used for forcing the raw biomass in a die holder. Ram is fixed in ram holder. These ram moves in a horizontal direction with the help of motor.

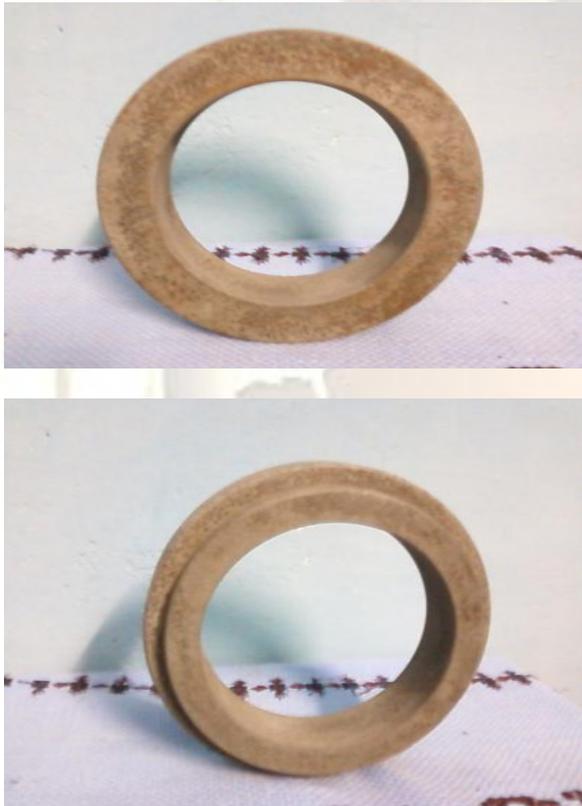
Collar :-collar is use to fix the die in a die holder. Also it is used for to prevent the flow of raw biomass in a wrong direction i.e. in motor direction. Die:- die is the part where the briquette get the shape to from the briquette.

Split die :- it is use to move the briquette in a cooling tower direction.

Cooling tower:- after process of briquette formation it cool at cooling tower and move in a direction of storage place.

### 3. Discussion of collar

Collar is one of the part of briquetting machine. This is placed between the die and ram. So it is placed in a very crucial place and this is a place where the beginning of briquette formation takes place. The diagram of collar is as follows.



Generally the collar is use as bearing material. But in this briquetting machine it is used for prevent the flow of raw biomass material in a direction of motor. Collar during the solidification of biomass going through various type of material also it faces the temperature, pressure. So it affect the life of collar.

Formation of briquette required tremendous speed so it affect the various part of machine especially affect the collar. Because it place at the beginning of process of briquette formation.

### 4. Discussion

Based on the knowledge and research about the briquetting machine for solidification of biomass. and getting the knowledge about the various part of briquetting machine. Each and every part of briquette machine is affected by temperature, pressure, moisture content and particle size of raw material impact indexed of shape fuel is deeply analyze in this paper. So we have to make that material of the briquette machine part which resist the all the condition of raw material in terms of pressure and temperature. so it is important to make the material of briquette machine part to resist the all worse condition for the formation of briquette biomass fuel.

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