

Rice Straw Paper

Processing Method



Collecting

The first step was collecting dry rice straw as a source of fiber (cellulose), Cellulose is a complex carbohydrate, the main structural component of plant cell walls, and the most abundant organic compound on Earth. This fiber was used for making a paper. Rice straw typically contains between 32% and 53.33% cellulose, depending on the specific rice variety and processing methods used. Other major components include hemicellulose (around 20-35%) and lignin (around 10-18%).

Image.1 : Raw material rice straw



Chopping

After collecting the rice straw, the process was continued to chopping rice straw into shorter piece. This process was conduct to make easier to grinding the rice straw using disk mill. Approximately the lenght of the rice straw is around 2-3 cm.

Image.2 : Cutting Fiber



Grinding

Before the fiber extracted from the rice straw, they need to be grind using a disk mill to make the particle size finer. After grinding, the particle size is around 1- 5 mm.

Image.3 : Grinding Fiber



Delignification

To extract cellulose fibers from rice husk we using NaOH (sodium hydroxide). NaOH acts as an alkaline solvent, dissolving lignin and other non-cellulosic materials, After that the process continued with bleaching using sodium hypochlorite (NaOCl) or hydrogen peroxide (H₂O₂) further purifies the cellulose. The percentage of NaOH that used was 5-10% for 150 gr Rice Straw and for bleaching, we used 5% H₂O₂.

Image.4 : Boiling Fiber In Alkaline Solution



Pressing

After cellulose fiber was obtained from delignification process, we need to press out the moisture from the fiber using filter cloth and hydraulic press.

Image.5 : Filtering and Pressing Out the Liquid



Screening

Cellulose fiber mixed with clean water with ration 1:20 and then dip the nylon screen into the solution to obtain the paper.

Image.6 : Screening Fiber



Drying

After screening , wet paper need to be dry using dehydrator at temp 60 C around 1 hour or dry under the sun around 2 hours depending on the weather.

Image.7 : Wet Paper After Screening Fiber

Result



Image.8 : Result Of Paper From Rice Straw With Raw Fiber



Image.9 : Result Of Paper From Rice Straw Without Raw Fiber



Image.10: Result Of Paper From Rice Straw With Raw Fiber Using Circular Mold Screen