

Ratanapat Hunsu-Udom 2009: A Property Study of Sulfate Pulp from Oil Palm Frond and Its Application. Master of Science (Packaging Technology), Major Field: Packaging Technology, Department of Packaging Technology. Thesis Advisor: Mr. Lerpong Jarupan, Ph.D. 134 pages.

From an attempt to reduce ongoing environmental problems to value-adding of existing unutilized oil palm wastes that are generated abundantly from the growing plantation and extraction operation, oil palm frond is considered as a material for extended development of molded pulp packaging. The purposes of this study not only aim to utilize the waste but also to examine the pulping condition by Sulfate or Kraft process as well as to improve the mechanical properties of molded pulp packaging. Cationic starch as a dry strength and alkyl ketene dimer (AKD) as a sizing agent were then added during the papermaking process for that purpose. A vibration testing for packaging performance in handling and transporting apples was also investigated. A pulping process could be prepared at an optimal condition of using 16% active alkali charge, 25% sulfidity, with a ratio 5:1 of the liquor to raw material under the cooking temperature of 160 °C for 180 min. Under this condition, a 29.19% of the pulp were yielded. The addition of cationic starch and AKD to give good strengths and water resistance were 1.4% and 0.5% by oven dry weight, respectively. The molded pulp packaging was produced by a hydraulic compression machine, and then compared with a foam tray and a common packaging molded from recycled pulp. It was found that the molded-pulp tray from oil palm frond, stored under a standard condition (27 °C, 65% RH) and a simulated cool room (12±2 °C, 90±5% RH) was capable to enduring a compression load at 1894 and 1679 N, respectively. Finally, the vibration testing showed that the stiff surface of the oil palm frond tray resulted for 88.89% bruised apples. To this end, it can concluded that molded pulp packaging using oil palm frond may rather satisfy to handle and transport rigid products. In addition, it should be pointed out that the property enhancemen can be done for the future research by using additives that develop the pulp bulkiness, in order to reduce effects that can be arisen from shocks during the application of transportation.

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Thesis Advisor's signature