PEMBUATAN DAN KUALITAS KARTON DARI CAMPURAN PULP TANDAN KOSONG KELAPA SAWIT DAN SLUDGE INDUSTRI KERTAS

(Manufacture and Qualities of Paperboard from the Mixture of Empty Oil-Palm Bunches Pulp and Paper-Mill Sludge)

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ABSTRACT

Small-scale paperboard industries in Indonesia are currently faced with the difficulty in procurement continuity of fibrous raw material (particularly pulp and waste paper). On the other hand, empty oil-palm bunches (EOPB) are abundant as waste from palm-oil processing and those ligno-cellulosic fiber stuffs have not been tilized effectively, hence suggesting their potential use for those paperboard industries. Related with such, the EOPB after being chipped has been experimentally pulped using hot soda semi-chemical process in the semi-pilot scale closed (pressurized) digester designed by the Center for Forest Product Research and Development, Bogor employing the cooking conditions: 10% alkali (NaOH) concentration, 1: 5.5 ratio of EOPB chips to cooking liquor, maximum temperature at 120 oC kept for 2 hours under 1.2 – 1.5 atmosphere pressure. The process afforded the EOPB pulp at 60.17%, kappa number 38.17, and alkali consumption 9.81%. Further, paperboard sheet was formed in a small-scale paperboard industry, from the mixture of 50% EOPB pulp and 50% paper-mill sludge; and from 100% EOPB pulp, each incorporating the additives (i.e. 5% kaolin filler, 2% alum retention, 4% tapioca binder, and 2% rosin size). Physical properties of paperboard from 100% EOPB pulp and from its mixture with paper-mill sludge (50% : 50%, respectively) were better than those produced by the small-scale industry traditionally using the mixture of 50% sludge and 50% waste paper without additives. This suggests the prospective use of EOPB pulp mixed with sludge, as alternative/substitute raw material in the paperboard industry that uses waste paper.

Keywords: Empty oil-palm bunches (EOPB), pulp, paperboard, and small-scale paperboard industry

ABSTRAK

Industri karton skala kecil saat ini mengalami kesulitan kontinuitas pasokan bahan baku (khususnya pulp dan kertas bekas). Limbah industri pengolahan minyak kelapa sawit dalam bentuk tandan kosong kelapa sawit (TKKS) sebagai bahan serat berligno selulosa berlimpah jumlahnya dan belum banyak dimanfaatkan, sehingga berindikasi pemanfaatannya sebagai bahan baku industri karton. TKKS sesudah dijadikan serpih, diolah menjadi pulp menggunakan proses semikimia soda panas tertutup pada ketel pemasak skala semi-pilot hasil rekayasa Pusat Litbang Hasil Hutan (Bogor) pada kondisi pemasakan: konsentrasi alkali (NaOH) 10%, nilai banding serpih TKKS dengan larutan pemasak 1:5.5, dan waktu pemasakan 2 jam pada suhu maksimum 120oC dan tekanan 1,2 – 1,5 atmosfir. Rata-rata rendemen pulp TKKS yang diperoleh 60,17%, bilangan kappa 38,17, dan konsumsi alkali 9,81%. Lembaran karton dibentuk dari campuran pulp TKKS 50% dan sludge industri kertas 50%; dan dari pulp TKKS 100%,

masing-masing dengan penambahan bahan aditif (kaolin 5%, alum 2%, tapioka 4%, dan rosin size 2%). Sifat fisik karton asal pulp TKKS 100% dan asal campurannya dengan sludge industri kertas (50% : 50%) lebih tinggi dari pada karton produksi industri rakyat (dari campuran kertas bekas 50% dan sludge 50%, tetapi tanpa bahan aditif). Hal ini mengisyaratkan prospek penggunaan pulp TKKS yang dicampur dengan sludge, sebagai bahan baku altermatif/pengganti pada industri karton yang menggunakan kertas bekas.

Kata kunci: Tandan kosong kelapa sawit (TKKS), pulp, karton, dan industri karton rakyat