Effect of Beating Revolution on Sweet Bamboo (*Dendrocalamus asper* Backer) Kraft Pulp Properties

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ABSTRACT

Chips of sweet bamboo were delignified by kraft pulping process. The obtained pulps were evaluated for unbleached pulp properties by beating effect. Considering the kraft pulping process, it was found that the effluent of active alkaline level could change pulp yield and kappa number. At similar 30% sulfidity and different (16–22%) active alkaline, the active alkaline charge was increased and screened yield and kappa number were decreased. When active alkaline increased 2 %, the pulp yield and kappa number decreased and about 2%. The highest sweet bamboo screened yield and kappa number were 46.32% by 12.5 points. It was selected to evaluate beatability and strength of unbleached sweet bamboo kraft pulp by PFI mill. The data presented the beating revolutions which importantly affected all pulp strengths and slightly affected optical properties as brightness. At 4000 rev. and freeness 388 ml,CSF it illustrated the highest tensile strength, 70.20 Nm/g and tear strength, 35.82 mN.m^2/g. In contrast, the highest burst strength and folding endurance were indicated at 5000 rev. and 300 freeness ml,CSF. They were 4.10 kPa.m^2/g and 492.20 r/c, respectively. The optical property of unbleached sweet bamboo kraft pulp was low brightness and was about 20% ISO.

Key words: *Dendrocalamus asper* Backer, Sulfidity, Active alkaline, Kappa number, Screened yield, Beatability

INTRODUCTION

The lack of long fiber support in Thailand's pulp and paper industries should be seriously considered. Although short fiber pulp can be locally produced, long fiber pulp must be imported. It is 100% imported, mainly from Canada, Chile, USA and South Africa. The long fiber pulp demand recently was 205,000 ton, 2% raised from 2000. The prediction of pulp and paper demand in next four years is expected to grow by 4% per annum (Thai Pulp and Paper Industries Association, 2001). Thus, the new long fiber resource for pulp and paper production is pointed towards non-wood plant such as bamboo which can be made available for pulp and paper industries.

Bamboo is one of the socio-economic plant species in Thailand. It is used for many purposes such as food, household construction, furniture and pulping. The most popular and available bamboo type is sweet bamboo which occupies about 153,227 rai (24,516 ha) (Pungbun Na Ayudhya, 2000). Kamthai (2003) reported the approximate fiber dimensions of sweet bamboo as: length 3.11 μm, fiber width 18.03 μm, lumen width 4.35 μm and cell wall