

Sustainable Utilization of bamboo for pulp and paper manufacturing in Thailand

By

Ratana Mormanee Forest research and development bureau Royal forest department

Abstract

This research examined the potential of bamboo utilization and qualified the bamboo pulping for pulp and paper manufacturing. The following three pulping processes were developed namely formacell, sulfate and soda processes in various conditions. The results showed that the formacell pulping from *Cephalostachyum virgatum* Kurz gave 42.88% yield, 22.6% kappa number and at 40°SR freeness. Then the physical properties of bamboo paper were analyzed which were 5,702.23 m breaking length, 431.43 KPa bursting strength, 88.8 cN tearing strength and 20.7% ISO brightness. On the other hand, the sulfate pulping from *C. virgatum* had a 41.18% yield with 16.91% kappa number. After beating for a few minutes; the paper properties were measured which were 5,165.29 m breaking length, 330.44 KPa bursting strength, 81.5 cN tearing strength and 27.6% ISO brightness. For the soda pulping from *C. virgatum* these was a 42.30 % yield with 31.29 %, kappa number after beaten, the paper strength gave 4,449.12 m breaking length, 272.78KPa bursting strength, 74.5 cN tearing strength and 32.4% ISO brightness. Then, the comparisons of soda pulp quality among 13 species of bamboos were performed. It is shown that about 5 species [*Bambusa logispiculata* Kurz, *Bambusa blumeana* Schult, *Thyrostachys siamensis* Gamble, *Bambusa arundinaceus* Wild, *Cephalostachyum virgatum* Kurz] gave a significantly high yield, high strength and brightness. Finally, it was possible for bamboo to perform in all processes with a good result. Particularly, five species of bamboo have shown high potential and good quality for pulp and paper, especially a high tearing strength and a high brightness.

Keywords: bamboo pulping, formacell process, sulfate process, soda process