

Effects Induced by Dispersion-Promoting Cylinder on Fiber-Concentration Distributions in Pulp Suspension Flows

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Abstract : Fiber-concentration distributions in pulp liquid flows behind dispersion promoters were experimentally investigated to explore the feasibility of improving operational performance of hydraulic headboxes in papermaking machines. The proposed research was performed in the form of a basic test conducted on a screen-type model comprising a circular cylinder inserted within a channel. Tests were performed using pulp liquid possessing fiber concentrations ranging from 0.3-1.0 wt% under different flow velocities of 0.016-0.74 m/s. Fiber-concentration distributions were measured using the transmitted light attenuation method. Obtained test results were analyzed, and the influence of the flow velocities on wake characteristics behind the cylinder has been investigated with reference to findings of our preceding studies concerning pulp liquid flows in straight channels. Changes in fiber-concentration distribution along the flow direction were observed to be substantially large in the section from the cylinder to four times its diameter downstream of its centerline. Findings of this study provide useful information concerning the development of hydraulic headboxes.

Keywords : dispersion promoter, fiber-concentration distribution, hydraulic headbox, pulp liquid flow

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