

BROWN IS THE NEW GREEN: HIGH CHARGED PULPS FOR TISSUE

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ABSTRACT

Sustainability is becoming more and more important in our lives and there is an imperative need to change our habits, to change our industrial processes and to change our mentality to promote a greener and healthier planet. Fully bleached fibers are used for many years in several applications and they demand non-friendly processes such as bleaching processes. Hygiene and tissue products are the main ones that require bleaching to increase brightness, increase water absorption capacity and promote softness. However, more sustainable alternatives are needed. One interesting alternative is unbleached fibers, as they are more sustainable than fully bleached fibers once fewer processes and chemicals are needed. One limitation of unbleached fibers can be the high lignin content present in the pulps, which can probably lead to lower softness and lower water absorption capacity. Some studies have been showing that oxygen delignification can increase significantly the acid carboxylic groups (also known as fiber charges) in the pulp which will promote higher fiber swelling. This is maximized when extended oxygen delignification is performed and when high lignin content is present in the pulp. The increase in fiber charges will promote the absorption properties for unbleached fibers, on the other hand, the high lignin content will impair the final pulp brightness. However, for some tissue products, brightness is not as relevant as the water absorption properties, so oxygen delignified fibers can be a great alternative to the bleached fibers. This replacement can reduce the environmental impact by lowering the carbon footprint from the bleaching process, making it a greener alternative.

The possibility of replacing fully bleached fibers with oxygen delignified fibers in tissue products was evaluated. High kappa number softwood pulps were subjected to kraft cooking and extended oxygen delignification and one fully bleached pulp was used for comparison. The pulps were refined in a PF mill and tissue handsheets were made. The water absorption properties were evaluated by water retention value, basket method and the Klemm method then the results for unbleached pulps were compared with the fully bleached pulps. It was seen that a significant increase in the water retention value can be obtained after an extended oxygen delignification when compared to the fully bleached pulps. The absorption capacity and absorption rate, for unbleached and bleached unrefined pulps, were quite similar, however, unbleached pulps showed a higher spreading of the water in the paper network. The study showed interesting results which reveal the potential replacement

Keywords: absorption properties, fiber charges, oxygen delignification, tissue, sustainability