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## Coating of Cellulose Nanofibers Suspensions on Paper

Cellulose Nanofibers (CNF) are a material that can be produced from wood fibers and other biomass materials. Some recent works have demonstrated the potential for CNF to upgrade paper surfaces, improving various properties such as printing. While some work has been presented about using CNF in a coating formulation, little has been reported on methods to coat this material onto paper. Here, rod, roll and blade coating of CNF are compared. CNF fibers were generated by extended refining methods as described in previous papers. The rheological properties of CNF were characterized with parallel plate geometry in a controlled stress rheometer. The solids of the material were changed by a filtration process over the range of 3.5 to 10.5%. A laboratory rod coater device, a roll coater, and blade coater were used to apply CNF onto the paper surface. The coat weight as a function of solids is reported. The coated paper was calendered prior to testing paper properties. Smoothness, air permeability, Bristow wheel absorption, brightness, stiffness, and pick velocities are reported. CNF is a highly shear thinning material with a power law index of around 0.1. The complex viscosity, storage and loss moduli, and the yield stresses are reported for a range of solids. The coat weight obtained for the rod and roll coating methods depend on the absorptive nature of the paper. A model is developed to predict the coat weight development. Paper coated with CNF had a reduced permeability, higher stiffness and a higher pick velocity.