

Short abstract proposal: Effects of wetting and drying cycles on paper strength

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Paper inevitably undergoes rewetting and drying in various manufacturing operations: adjustment of moisture profiles in reel building in printing papers, application of starch adhesives in corrugating, application of aqueous barrier coatings, application of water based inks in flexography, increase in moisture during 4 color offset printing. Moreover, fluctuations in ambient humidity causes surface topography to irreversibly change, leading to cockle in some cases. Quantification of characterization of the effects of wetting/drying cycles on paper properties is missing in the paper physics literature. Generally there are losses in strength properties from unrestrained wetting straining and subsequent drying. The proposal here is to investigate and perform a systematic study on a series of laboratory and commercial papers regarding the effects on physical properties of rewetting/drying on paper. The loss in strength from these processes and decreases in creep resistance once characterized and understood, can be controlled and limited through minimizing the moisture history in converting processes thus ultimately saving in basis weight of many products.