SELVOL™
POLYVINYL ALCOHOL

Selvol Polyvinyl Alcohol for Paper and Paperboard Containing Secondary Fiber

Selvol Polyvinyl Alcohol, as a surface-applied strength additive, can be used to help overcome the strength losses created by the continued reuse of secondary fiber.

INTRODUCTION

The push for secondary fiber usage has challenged the papermaker with another set of technical issues in today's environmentally conscious world. Most all paper and paperboard grades now include some percentage of recycled fiber in their furnish. The continued reuse of these reclaimed fibers reduces the overall physical strength of the paper or board due to a number of factors. These include a reduction in fiber length from repeated refining operations, a loss in fiber-fiber bonding due to a reduction in hydrogen bonding and a loss of fiber swell ability from repeated drying operations.[1]

Polyvinyl alcohol (PVOH) is the strongest binder in the paper industry.[2] As a surface-applied additive, polyvinyl alcohol can provide both sheet physical strength and surface strength to a paper or paperboard containing secondary fiber. In addition, since PVOH is applied at the surface after sheet formation, balancing the wet end chemistry for polyvinyl alcohol is not necessary. Finally, PVOH is in tune with the environment due to its complete biodegradability.

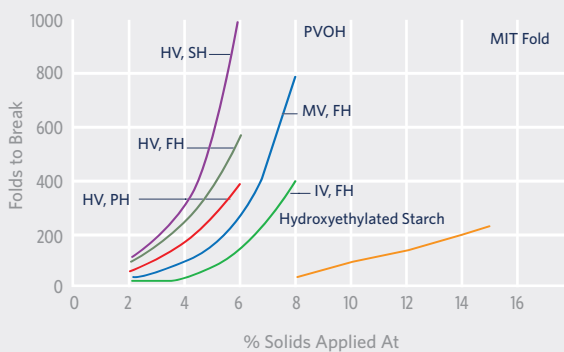[1] Ellis R. L. and Sedlachek E., TAPPI 76(2): 143(1993).
[2] TAPPI Monogram No. 37; Synthetic Binders in Paper Coatings.

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FIGURE 1: Laboratory Size Press Study Polyvinyl Alcohol vs. Starch on 77 g/m² Base Paper


LABORATORY STUDIES

Mullen burst and MIT fold tests were performed comparing the strength of Selvol polyvinyl alcohol to hydroxyethylated corn starch when used as a surface-applied sizing agent. The Selvol polyvinyl alcohol grades used in the tests were high, medium or intermediate viscosities (HV, MV, IV), and they were either super, fully or partially hydrolyzed (SH, FH, PH).

The results of the tests, shown in Figures 1 and 2, demonstrate the superior strength provided by the PVOH. Uncoated printing papers containing secondary fiber may be prone to an increase in fiber picking and linting during printing due to the decrease in fiber bonding.

The surface application of PVOH can greatly improve surface strength characteristics. Figure 3 demonstrates the improvement in Dennison Wax Pick with increasing percentages of PVOH in a PHOV/starch solution.

Other properties, including tensile strength, water resistance, Gurley Porosity, oil and grease resistance, abrasion resistance and optical brightener efficiency, will also improve with the use of PVOH.

FIGURE 2: Laboratory Size Press Study Polyvinyl Alcohol vs. Starch on 77 g/m² Base Paper

FIGURE 3: Surface Strength - Dennison Wax Pick on 77 g/m² Base Paper
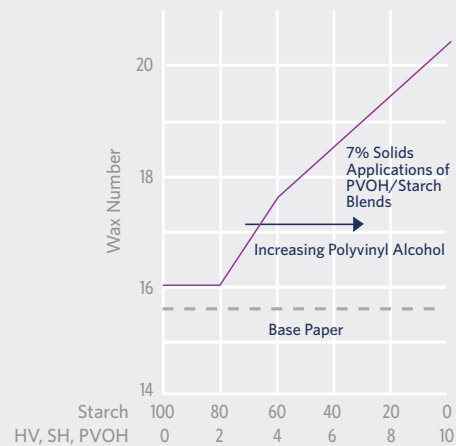
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