



EFFECT OF GRAIN ALIGNMENT ON FABRIC PROPERTIES MEASURED WITH THE FAST SYSTEM

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Fabric mechanical properties have been used to explain and understand certain problems in apparel production; however, limited research examining the relationship between fabric grain alignment and apparel quality exists.

This study examined the effects of a common apparel industry practice, tilting patterns off-grain on fabric mechanical properties. Our objective was to test the appropriateness of the FAST system for assessing changes in grain alignment on fabric mechanical properties quantitatively related to drape.

Fourteen commercially available fabrics were selected for analysis. To investigate the effect of grain alignment on fabric mechanical properties, warp and weft fabric specimens were cut in six different tilt angle variations (0°, 2°, 4°, 6°, 8°, and 10°). Right and left bias samples were also included. For each tilt variation, three specimens were tested from each fabric. The 0° specimens, cut on straight grain, served as controls. A computer marking system was used to accurately tilt and position each specimen. Fabric specimens were then cut, and specimens labeled with tilt angle and warp grain prior to testing.

Increases in bending length, bending rigidity, formability, extension measured at three different loads, and dimensional stability, although not significant, were observed with increased tilt. No relationship between tilt and shear rigidity was observed.