World Academy of Science, Engineering and Technology
International Journal of Materials and Textile Engineering
Vol:12, No:07, 2018

Study of Drape and Seam Strength of Fabric and Garment in Relation to Weave Design and Comparison of 2D and 3D Drape Properties

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Abstract : Aesthetic and performance are two most important considerations along with quality, durability, comfort and cost that affect the garment credibility. Fabric drape is perhaps the most important clothing characteristics that distinguishes fabric from the sheet, paper, steel or other film materials. It enables the fabric to mold itself under its own weight into desired and required shape when only part of it is directly sustained. The fabric has the ability to be crumpled charmingly in bent folds of single or double curvature due to its drapeability to produce a smooth flowing i.e. 'the sinusoidal-type folds of a curtain or skirt'. Drape and seam strength are two parameters that are considered for aesthetic and performance of fabric for both apparel and home textiles. Until recently, no such study have been conducted in which effect of weave designs on drape and seam strength of fabric and garment is inspected. Therefore, the aim of this study was to measure seam strength and drape of fabric and garment objectively by changing weave designs and quality of the fabric. Also, the comparison of 2-D drape and 3-D drape was done to find whether a fabric behaves in same manner or differently when sewn and worn on the body. Four different cotton weave designs were developed and pr-treatment was done. 2-D Drape of the fabric was measured by drapemeter attached with digital camera and a supporting disc to hang the specimen on it. Drape coefficient value (DC %) has negative relation with drape. It is the ratio of draped sample's projected shadow area to the area of undraped (flat) sample expressed as percentage. Similarly, 3-D drape was measured by hanging the A-line skirts for developed weave designs. BS 3356 standard test method was followed for bending length examination. It is related to the angle that the fabric makes with its horizontal axis. Seam strength was determined by following ASTM test standard. For sewn fabric, stitch density of seam was found by magnifying glass according to standard ASTM test method. In this research study, from the experimentation and evaluation it was investigated that drape and seam strength were significantly affected by change of weave design and quality of fabric (PPI & yarn count). Drapeability increased as the number of interlacement or contact point deceased between warp and weft yarns. As the weight of fabric, bending length, and density of fabric had indirect relationship with drapeability. We had concluded that 2-D drape was higher than 3-D drape even though the garment was made of the same fabric construction. Seam breakage strength decreased with decrease in picks density and yarn count.

Keywords : drape coefficient, fabric, seam strength, weave
Conference Title : ICTEFSIM 2018 : International Conference on Textile Engineering, Fiber Structure and Investigation Methods
Conference Location : Paris, France
Conference Dates : July 19-20, 2018