

A New Approach For Wrinkle Recovery Evaluation of Worsted Fabrics Using Fuzzy Systems.

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Abstract

In present study, designing and fabricating a device similar to wrinkle recovery AATCC 128, and using microcontroller and computer, various torsional strains imposed to the fabric and the fabric wrinkle force was measured using a load cell.

An stepper motor and screw shafts with different pitches were used to impose various strains on the fabric. Then the fabric surface changes in both direction of weft and warp were examined using image processing. Dimensional changes results in weft and warp directions were considered as $(\frac{s_1}{s_2})$ to represent input criteria to fuzzy model.

The results of this research revealed that fabric samples with higher polyester fiber content exhibited, better wrinkle recovery and less wrinkling. According to the model of fuzzy, fabric wrinkling and deformation can be classified according to there properties and in this way the classes of fabrics can be determined.

Key Words: Torsional strain, Fuzzy system, wrinkle, Microcontroller.

Introduction

The buckling, bending, drape, wrinkle behaviors of a woven fabric influence its performance during actual use and during the process of making-up into the end product. These properties are important, particularly when the fabric is limp, resulting in large-scale deformation even under small applied forces^[1,2]. By using AATCC machine the mechanism of creating wrinkled fabrics starts. In this operation, the fabric forms as a tube shell and two edge warp round the two flanges. Then a 3.5 Kg weight sets above the upper flange which is movable. Therefore, the upper flange by using a pilot bar rotates 180 degrees and rolls downward. This operation causes the fabric wrinkles and because of fabric properties, the fabric after the deformation returns to the primary state and also according to atmospheric standard conditions regarding to five wrinkled standard samples (replica), the fabric will be classified by experts^[4,5]. The most important weakness of this method is that because this

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