World Academy of Science, Engineering and Technology
International Journal of Materials and Textile Engineering
Vol:12, No:06, 2018

Effect of Weave on Cotton Fabric to Improve the Durable Press Finish Rating

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Abstract : Cellulose fibres, mainly cotton, are the most important kind of fibre used for manufacturing shirting fabric. However, to overcome its main disadvantage, that is it gets wrinkled after washing, is to use special kind of finish which is resin finish. This finish provides a resistance against shrinkage along with improved wet and dry wrinkle recovery to cellulosic textiles. The Durable Press (DP) finish uses a mechanism of cross-linking with polymers or resin to inhibit the easy movement of the cellulose chains. The purpose of these experimentations on the weave is to observe and compare the variations in properties after DP finish without adverse effect on strength of the fabric. In this work, we have prepared three types of fabric weaves viz. Plain, Twill and Sateen with their construction parameters intact. To get the projected results, this work uses three types of variables viz. concentration of Resin, Temperature and Time. Resultant of these variables is only change in weave or construction on DP finish which further opens the possibilities of improvement of DP either of mentioned weaves. The combined effect of such various parametric resin finish methodology will give the best method to improve the DP. However, the DP finish can cause a side effect of reduction in elasticity and flexibility of cellulosic fibres. The natural cellulose could loss abrasion resistance along with tear and tensile strength by applying DP finish. In this work, it is taken care that the tear strength of fabric will not drop below certain limit otherwise the fabric will tear down easily. In this work, it is found that there is a significant drop in tearing and tensile strength with the improvement of DP finish. Later on, it is also found that the twill weave has more percentage drop in tearing strength as compared to plain and sateen weave. There is major kind of observations obtained after this work. First, the mixing of cotton should be done properly to achieve the higher DP rating in plain weave. Second, the careful combination of warp, weft and fabric construction must be decided to avoid the high drop in tear and tensile strength in a twill weave. Third, the sateen weave has a good sheen and DP rating hence it can be used in shirting of gents and ladies dress materials. This concludes that to achieve higher DP ratings, use plain weave construction than twill and sateen because it has the lowest tear and tensile strength drop.

Keywords : concentration of resin, cross-linking, durable press (DP) finish, sheen, tear and tensile strength, weave
Conference Title : ICTEFSM 2018 : International Conference on Textile Engineering, Fabric Structure and Manufacture
Conference Location : Paris, France
Conference Dates : June 25-26, 2018