

Effect of yarn structure variables on pilling performance for blended woven fabrics

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ABSTRACT:

Pilling is undesirable dilemma that badly influences the handle and appearance of fabrics. This work aimed at studying the effects of four yarn factors (cotton materials, twist multiplier, cotton/polyester blend ratio and spinning system) on pilling propensity of cotton/polyester blend woven fabrics under five pilling cycles from 500 up to 2000 rubs. Results showed that fabrics which are woven by using the two Egyptian varieties of Giza 86 and Giza 95 reflect good pilling-resistance compared to the Greece variety of Meddling. There was negative association between twist multiplier and pilling propensity indicating that the cotton/polyester fabrics woven using the highest twist multiplier had high pilling-resistant and vice versa. It is found that the pilling propensity would be increased when the polyester proportion increased in the cotton/polyester blend fabrics. It is concluded that the fabric samples produced using combed yarns had the best pilling-resistant compared to those fabrics woven using carded yarns. This result is only being hold true when using 125 and 250 rubbing cycles. Using 500 up to 2000 pilling rubs, fabric samples produced using carded or combed yarns had convergent pilling behavior. Results of multiple linear regression model exhibited that the four yarn factors (cotton materials, twist multiplier, cotton/polyester blend ratio and spinning system) explained the majority variation of pilling behavior expressed as coefficient of determination (R^2 %) indicating that the studied yarn factors were already among the main contributors that robustly affecting the pilling phenomenon. Among these studied factors, it is appeared that the polyester proportion % of the cotton/polyester blend fabrics is the main determinant in their pilling performance.

Key words:

cotton/polyester, blend fabrics, yarn structure, pilling performance.