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The Permeability and Water Resistance Properties of Fabric Treated with Nano Coating Spray After Repeated Number of Washings

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Structured Abstract

Background: Surface spray coatings are commonly applied to textiles to improve functional properties such as air permeability, water resistance and moisture management. These coatings are typically only applied to the surface of the fabric, making it susceptible to degradation during repeated washing. As a result, the durability and long term performance of coated cotton fabrics under real world washing conditions requires systematic evaluation.

Methods: In the experiment, there was the application of surface spray coating on 100 percent cotton fabric. Functional and physical characteristics of the coated and standard fabrics tested are air permeability, water permeability and moisture management performance. Mechanical washing has been repeated as many as twenty-five times. The fabric performance was studied in relation to the transformation at a given washing cycle to measure the durability of the coating.

Results: The findings indicate that the initial surface coating enhances air permeability although it significantly decreases moisture management competency. After multiple washing, fabric qualities changed considerably. The air permeability, the water permeability and the moisture management are all reduced to a considerable degree in the initial washing cycles and then restored to some extent upon further washing. This is because the variances were caused by the applied surface coating that is degraded following the washing process and influences the fabric pore structure as well as the transport of moisture and water resistance.

Conclusion: In conclusion, this study reveals that although surface spray coating could initially enhance some of the functional properties of cotton fabrics, repeated washing has a significant effect on the durability of fabrics. Deterioration of the surface layer affects the performance of the fabric in the long term. These results highlight the necessity of evaluating initial performance as well as wash stability in the formation and utilization of surface coatings applications in the textile industry.

Keywords: Nano Coating Spray, 100% Cotton Fabric, Air Permeability, Water Permeability, Moisture Management

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