

A Comparative Analysis of Selected Knitted Fabric Structure For Sports Attire

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Structured Abstract

Background: Sports attire is about utility, comfort, and safety with specifications devised and intended to produce a product that meets the performance demands of athletes. Sportswear must have important functional properties such as have optimal control of heat and moisture and have good air permeability properties to meet the requirements of sportswear.

Methods: In this study, three different types of knitted structure named A, B, and C were used. Several tests were conducted on the fabric sample and divided into two categories i.e.: fabric preparation and fabric testing. Fibre identification was evaluated by doing burning test, solubility test, and microscopic analysis. Meanwhile, for fabric parameter, the physical properties of the fabric were evaluated by conducting a few tests i.e.: thickness, fabric weight, fabric stitch density and fabric structure. Fabric strength, air permeability test, water vapour permeability test and moisture management test were done to evaluate the performance of the fabric. Then, the correlation between fabric physical properties and mechanical properties were evaluated.

Results: From the testing conducted, the knitted structures were identified. Based on the performance evaluation, tricot knit fabric has the highest elongation at break which 153.68%. Double jersey knitted fabric showed the highest air permeability compared to bird's eye knit fabric and tricot knit fabric. Tricot knit fabric has the highest breathability based on the water vapour permeability test. Meanwhile, the bird's eye knit fabric has the properties of fast absorbing and quick drying fabric based on the MMT make it as an option for the construction of sports attire. From the correlation evaluation, it shows that few mechanical properties have a strong correlation with the physical properties of the fabric.

Conclusion: In conclusion, the comparative analysis of selected knitted fabric structures for sports attire is an important field of study that may assist enhance the comfort and performance of the sports attire. Based on the results obtained, the performance of the fabric samples varies accordance with the fabric structure. From the correlation, it can be concluded that the mechanical properties of the fabrics are dependent with the fabric physical properties.

Keywords: Sports attire performance, Knitted fabric structure, Physical properties, Mechanical properties

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