

STRUCTURE, CHARACTERISTICS AND IMPACT OF TREATMENT ON DURABILITY OF DENIM FABRIC CONTAINING ELASTOMERIC FIBRE

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Core-spun yarn is made by twisting sheath yarn (normally cotton fibre) around the core filament (elastic fibres) [1]. The aim of the study is to evaluate the effect of fibre composition and the number of weft yarns per centimetre on tensile properties, abrasion resistance and air permeability of denim fabrics containing multifilament yarn.

In this study, denim fabric abrasion resistance, tensile and tear strength indicate durability and air permeability is considered as comfort parameter. Five denim fabrics were produced with the same fabric parameters but different number of weft yarns per centimetre and four fabrics contained multifilament ring core-spun yarns in the weft direction.

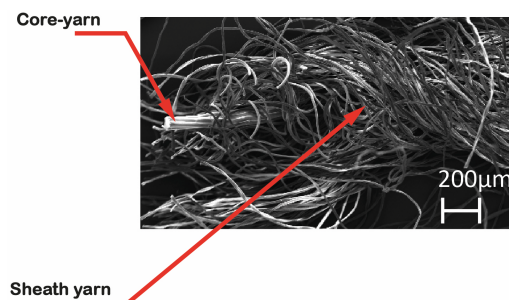


Fig.1 Core-spun yarn SEM image.

Test results showed that polyester in the core resulted two times better specific stress than cotton-elastane denim fabrics. Fabric with lower number of yarns per centimetre (16 yarns per cm) showed better air permeability ($(41.7 \pm 1.2) \text{ l}/(\text{m}^2 \cdot \text{s})$) but low abrasion resistance (20 000 rubs). Fabric (20 yarns per cm), which had the highest number of yarns per centimetre showed the lowest air permeability ($(27.4 \pm 1.2) \text{ l}/(\text{m}^2 \cdot \text{s})$) and highest abrasion resistance (40 000 rubs). From this study it was concluded that the fabric which weft yarn contains polyester, viscose and elastane satisfies comfort and durability properties the most [2].

References

1. Babaarslan, O., Sarioğlu, E., Çelik, H.-I., Avci, M.-A. Denim Fabrics Woven with Dual Core-Spun Yarns IntechOpen 2016: pp. 1-22. 10.5772/intechopen.80286
2. Mandre, N., Plamus, T., Krumme, A Impact of Weft Yarn Density and Core-yarn Fibre Composition on Tensile Properties, Abrasion Resistance and Air Permeability of Denim Fabrics, Materials Science (Medžiagotyra), 2021, 27(4). <https://doi.org/10.5755/j02.ms.27532>