

Comfort and antimicrobial properties of textiles and footwear (ComforMicrobTexFoot)

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ABSTRACT

The project focuses on the systematic investigation of structure and properties of spun nonconventional yarns from man-made cellulosic fibres for production of knitted fabrics worn next to the skin. One of the goals is to develop suitable knitted structures (intended for underwear and hosiery) regarding to thermophysiological comfort and antimicrobial properties. Comfort of knitted fabrics for making clothing to be worn next to the skin and knitted fabrics for making hosiery has not been systematically investigated to a greater extent, whereby all spun nonconventional yarns from man-made cellulosic fibres were used. Structure parameters and properties of nonconventional spun yarns and knitted fabrics, thermophysiological knitted fabric properties in the form of a surface structure and thermophysiological properties of hosiery and footwear on thermal foot will be determined as important factors affecting comfort.

The objective of the research part of the antibacterial treatment of the knitted fabric against pathogenic bacteria is to achieve a satisfactory level of antibacterial protection, good stability in daily use and care. Samples of the knitted fabric will be antibacterially processed using new antibacterial agents commercially available and applied to the material by conventional treatment methods or by use of plasma as a new environmentally friendly technology in treatments of textile materials. Besides, research will focus on the development and possible application of agents on the basis of plant products such as tea tree oil which is known for its antimicrobial action. It is relatively little known about the antibacterial activity of the knitted fabrics for making clothing to be worn next to the skin, especially the leather for making working and protective footwear. Antibacterial activity of grey, antibacterial treated and dyed knitted fabrics for making clothing worn next to the skin according to 3 types of bacteria that can be found in the normal physiological flora of human skin, and which can be opportunistic pathogens will be determined. An antibacterial activity and the comfort of the leather intended for the manufacture of work and protective footwear will be investigated. The definition of antibacterial activity will be an important factor that could affect the very care and the application of garments and footwear.

The evaluation of performance and functional properties of knitted fabric, leather and multi-layered material constructions will be performed.

Durability and fastness of the performed treatments on the materials will be defined by simulating the conditions of application – care and use (by implementing repeated cycles of washing and drying, abrasion, bending and colour fastness rate to different influences)..

KEYWORDS

Nonconventional yarns, knitted fabric, leather, thermophysiological properties, antimicrobial treatment, durability and fastness.