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STUDY OF THE INFLUENCE OF ANTIBACTERIAL TREATMENT ON HYGIENIC PROPERTIES OF TEXTILE MATERIALS

Introduction. Sustainable increases in knowledge about microbiology and human health are helping society to realise the importance of using antibacterial textiles. Measures to reduce the spread of bacteria on surfaces where they can cause diseases are becoming progressively preferred. Antibacterial textiles can be useful at home, at work and in public places to ensure cleanliness and safety [1, p. 1].

Antibacterial agents are used in many areas of human activity, including medicine, household, food industry, etc. They can have different mechanisms of action, such as damaging the cellular structures of bacteria or preventing their development by blocking the processes of assimilation and cell formation. This prevents the spread of infections and protects people from harmful microflora [2, p. 114].

The treatment of textile materials with antibacterial agents, known as hygienic treatment, helps to prevent the spread of pathogenic bacteria. These substances prevent the microbiological decomposition of sweat and unpleasant odours (deodorisation). Antimicrobial treatment prevents the development of microorganisms, fungi, yeasts, actinomycetes and bacteria [3, p. 38; 4, p. 388].

Keywords: *antibacterial treatment, hygienic properties, antibacterial textiles, antibacterial agents, quality, finishing production.*

Aim. To determine the hygienic properties of textile materials after antibacterial treatment.

Methodology. Antibacterial treatment of blended textile material with antibacterial agent with proved antibacterial action. DSTU ISO 9237:2003 Textiles. Fabrics. Determination of the permeability of fabrics to air ISO 9237:1995, IDT). DSTU ISO 4920:2005 Textiles. Determination of resistance to surface wetting (spray test) of fabrics (ISO 4920:1981, IDT).

Research results. To study the efficiency of antibacterial treatment of blended textile materials (PE-70%/B-27%/EI-3%), 3 samples were made at the Kyiv National University of Technologies and Design, namely: No. 1 Control; No. 2 treated with an antibacterial agent with a concentration of 2 g/l in the working bath (China); No. 3 treated with an antibacterial agent with a concentration of 2 g/l in the working bath (Japan).

The hygienic characteristics of the treated textile materials, namely hygroscopicity, vapor and air permeability, were investigated in the Analytical and Research Testing Laboratory 'Textile-TEST' of KNUTD. The results of the research are presented in Fig. 1.

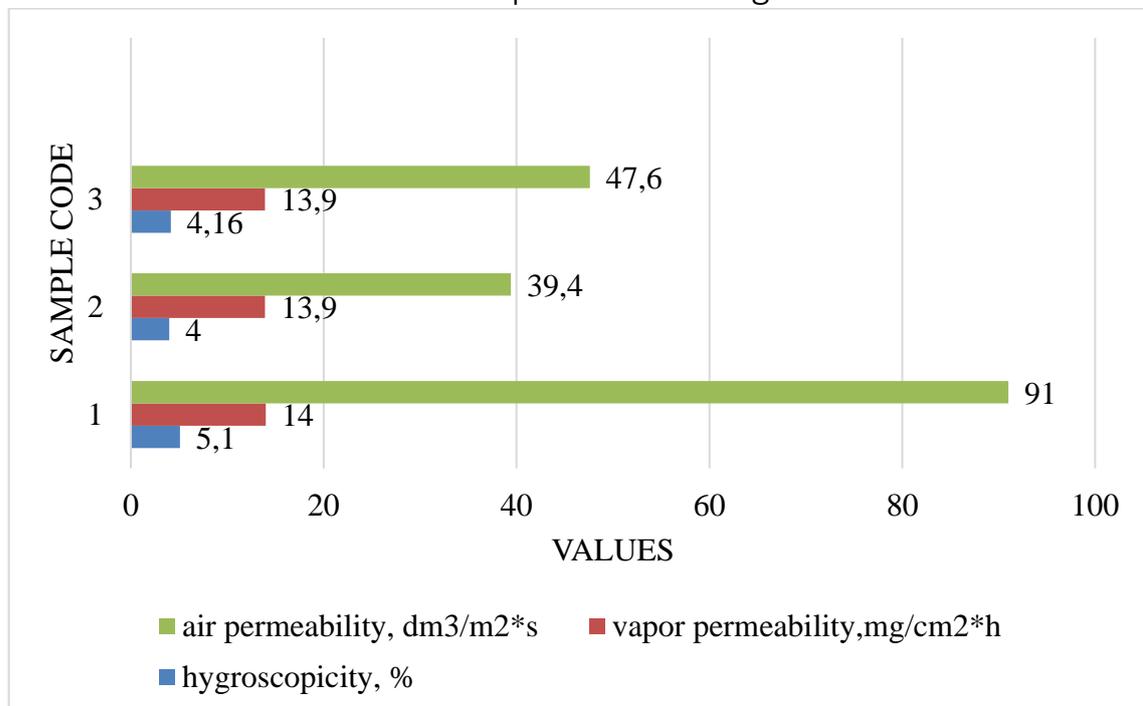


Fig. 1. Hygienic characteristics of blended treated fabrics

According to the results of the research, compared to the control sample, a decrease in the values of hygroscopicity is observed: 1.1%

(No. 2) and 0.94% (No. 3); air permeability: 51.6 dm³/m²*s (No. 2) and 43.4 dm³/m²*s (No. 3), respectively. This may indicate the high quality of the antibacterial treatment. This treatment did not actually change the vapor permeability of textile materials.

Conclusion. The hygienic characteristics of the treated textile materials, namely hygroscopicity, vapor and air permeability, were investigated. Analyzing the results of the study, compared to the control sample, there is a decrease in the hygroscopicity values, which indicates the high quality of the antibacterial treatment. The air permeability values remain virtually unchanged. The research results underline the importance of antibacterial treatment for further study and application for consumer purposes.

References

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