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PRINCIPLES OF SELECTING THE MATERIALS RANGE FOR PROFESSIONAL SPORT FENCING CLOTHING MANUFACTURING

Purpose. The authors present a theoretical justification of the key principles of materials assortment selecting for professional sport fencing clothing manufacturing.

Keywords: sport clothing, professional sport fencing, textile materials for the production of special protective clothing.

Objectives. The analysis of trends in the development of materials for the fencing clothing manufacture shows the use of traditional artificial, synthetic and natural fibres and threads (viscose, nylon, polyester, polypropylene, polyamide, polyethylene, cotton), and of the advantages of using such fibres and high strength complex threads as Kevlar® (DuPont, USA), Terlon, Dyneema® (DSM High Performance Fibres Group, Holland) and CBM.

Fabrics of Kevlar fibres have high resistance and elasticity to impact loads, but at the same time, low resistance to bending loads. Therefore, this fibre is used more for armour protection products manufacturing, and for fencing clothing, it is used only in combination with other fibres [1].

Terlon fibre is similar in origin and properties to Kevlar, but differs in lower density and cost.

Dyneema® by DSM, HPPE (High Performance Polyethylene) is a high-quality polyethylene fibre (continuous, bonded thread). Materials made of this fibre are light, resistant to ultraviolet radiation and the effects of high temperatures, as well as waterproof.

The complexity of developing textile materials for manufacturing special protective clothing for fencers is associated with the need to provide it with a complex of properties that may conflict with each other. In fact, simultaneous provision of the necessary protective and consumer properties according to a number of indicators is difficult to achieve.

Methodology. The research was based on the methods of the system approach. Methods of analysis and synthesis were used to achieve results in the work process.

Research results. The main function of the lining layer is to ensure the hygienic properties of the clothing, although sports and technical requirements often conflict with hygienic ones. Multi-layered equipment, performing a protective function, does not contribute to maintaining the normal thermal balance of the body during training. In competition conditions under a tight suit, heat transfer is so small that the human body overheats. Long-term use of professional clothing and intense sweating caused by physical exertion have a negative effect on the microflora of the clothing environment.

Fabrics that can be used for fencing clothing manufacturing are characterized by high protective properties [1]. The essence of the development of the proposed materials is aimed at improving both protective, operational, and technological indicators. Known fabrics have the necessary protective properties, but they are excessively rigid, which negatively affects the consumer properties of sports clothing.

The main technical task of the developers is to get a lighter, thinner, and softer material while maintaining protective properties and reducing its material capacity. Of course, with equivalent values of the 'puncture resistance' indicator, preference is given to textile materials with better operational and technological properties (surface density, thickness, stiffness, breathability, etc.). Providing the main functions of fencing clothing is more facilitated by the use of knitted fabrics [2-4].

The well-known two-layer knitted fabric, produced by the Ukrainian trademark StM [5] is effectively used for the manufacture of fencing suits with the 1st level of protection. Equipment made of knitted fabric of this manufacturer has optimal consumer properties. StM provides fencers with competitive fencing suits, along with the world's best analogues.

As a rule, manufacturers that have achieved significant results in the development of a range of equipment for professional fencing athletes (ALLSTAR, UHLMANN, NEGRINI FENCING LINE, CARMIMARI SCHERMA, PBT FENCING) work according to a scheme that includes basic materials manufacture for fencing clothing and is confidential in nature. This limits the possibilities of finding reliable information about the properties of such materials.

Conclusion. The key principles of selecting a materials range for the clothing manufacture for professional sports fencing are formulated. The main technical task of the developers is to get a lighter, thinner, and softer material while maintaining protective properties and reducing its material capacity. Knitted fabrics favour more the provision of the main functions of such clothing.

It has been established that for the manufacture of fencing suits of the 1st level of protection, it is possible to recommend a two-layer knitted fabric, manufactured by the Ukrainian trade mark StM.

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