

## DEVELOPMENT OF A PACKAGE OF MATERIALS FOR WOMEN'S UNIFORMS OF LAW ENFORCEMENT AGENCIES

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**DOI: 10.5958/2249-7137.2022.00389.5**

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### ABSTRACT

*Women’s Uniform design and equipment of special units for law enforcement conditions at the present time many studies have been devoted both in Uzbekistan and abroad. Clothing for special purposes must have special properties: ergonomic, functional, protective, operational, meet the requirements of efficiency. Design special purpose clothing is a challenge, the solution which requires an integrated approach that takes into account the increased requirements to the performance of manufactured clothing, as well as the results of a comprehensive analysis of the current requirements of potential consumers who are associated with the characteristics of their professional activities and high risks of safety of their lives arising from when performing official tasks.*

**KEYWORDS:** *Innovative Way’s Technologies, Membrane Materials, Production Of Clothing, "Smart Textiles", Special Clothing.*

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### INTRODUCTION

The main reasons for the loss of manpower and equipment during combat actions in the mountains are due to the impact of external natural factors. As statistics show, accidents in the mountain conditions most often associated with natural and climatic factors. Of them about 11% is directly related to the equipment of a specialist. In this work, the clothes of the team members are designed. special purpose for mountain conditions. Training of mountain fighters spetsnaz includes elements of mountaineering training. During combat action in the mountains, fighters must quickly and covertly overcome natural obstacles, as well as to cross mountain rivers. climbing equipment and clothing should be durable, comfortable, have light weight and be

impervious to water and wind. In spite of modern equipment, there is a risk of death from avalanches and rock falls. [1]

For the manufacture of special clothing, it is allowed to use fabrics from natural fibers and mixed (from a mixture of natural fibers with chemical fibers (threads)) with various types of finishes or impregnation (water-repellent, oil-resistant, etc.) To determine the possibility of using in the clothes of employees special forces detachment of the existing range of modern materials were analyzed. At the beginning of the last century, military clothing was made from tarpaulin, a storm suit was made from it, consisting of a jacket with a hood, trousers and mittens.

Wool was used as insulation at that time, in a set of mountain uniforms included woolen underwear, a sweater, balaclava, socks and gloves. As insulation for winter suits and sleeping bags, cotton wool was used. At the end of the 20th century, from the data materials were made uniforms for the Soviet military personnel in Afghanistan. Tarpaulin clothing has significant and disadvantage - bad Waterproof, takes a long time to dry when wet. The insulating layer woolen things poorly removes moisture from the underwear space, quickly gets wet and at the same time loses thermal insulation efficiency. Winter clothing with wool insulation has a lot of weight, repeatedly increasing when wet. Subsequently, mountain uniforms began to be made from synthetic materials. [2]

In 1969, the first membrane fabric was patented using polytetrafluoroethylene (PTFE). The principle of operation of membrane tissue is as follows: water in the form of steam from the undergarment layer excreted through microscopic pores. These pores are much smaller than a drop water, so water in the form of precipitation cannot penetrate the undergarment layer. Membrane fabric has become widely used for the manufacture outerwear, is now widely used for tailoring army uniforms and sportswear. There are the following types of membrane materials: microporous in film form with pores (Gore-Tex), hydrophilic or non-porous (SympaTex) and combined (Triple Point) Combined membrane materials have all the advantages of porous and non-porous membranes, but rather expensive. The main feature of these materials is wind, waterproof and vapor permeable. Gore-Tex fabrics are produced in an innovative way's technologies through covering the membrane with high quality fabrics, followed by sealed to protect against moisture. The SympaTex membrane is a thin hydrophilic a membrane made from a copolymer of polyester and polyether. [3]

The SympaTex membrane is lightweight and has good dynamic characteristics that allow stretching in all directions. Membrane materials are wind and water resistant, vapor permeability, but at the same time they have a significant disadvantage: when fabric rubs against fabric, noise occurs, which is unacceptable in clothing employees of the special force's detachment for mountain conditions. The domestic company "Tchaikovsky Textile" produces special purpose, including fabrics for uniforms of power structures and government departments with protective properties, due to the use of various types and membrane impregnations.

Modern research is focused on the production of clothing, capable of adapting to various environmental changes, which is of interest to manufacturers of military clothing and equipment. When designing camouflage for military clothing, it is necessary take into account that these materials must have a high resistance to external factors (to the action of light weather, mechanical friction, washing and dry cleaning). The second direction - intellectual is connected with production and industrial development of design and development technologies materials

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with specific properties. According to the developers, "smart textiles" should be able to track functions and condition of a person, if necessary, introduce medicinal means and signal well-being in case of injury. AT clothes of special forces officers' important requirements for "smart textiles" are the following: self-cleaning, maintenance required and temperature in the underwear space, neutralization of chemical toxic substances, protective properties body armor, while clothing should remain light, not restrictive movements. [4]

The introduction of highly scientific technologies (hi-tech) makes it possible to realize these requirements for the clothing of military personnel with fundamentally new properties. Nanotechnology in the production of materials is a modern direction in the field of designing textiles with properties not inherent in ordinary material. Due to the small particle size, forming the material, its structure changes dramatically, increases inner surface, due to which the material acquires a completely new property. Internal structure formed from nanoparticles, gives materials high strength characteristics, etc. specific properties

The analysis showed that the existing methods designing special clothing does not fully satisfy the problem of designing ergonomic clothing for special forces for mountain conditions. Lack of regulatory documentation regulating the requirements for clothing for employees of a special detachment destination, necessitates the development of a process concept design, which will include steps to improve protective and ergonomic features designed clothes. The structure of the design process for this type of clothing represented by stages grouped by levels characterizing sequentially performed types of work to create new samples special clothing.

This structure includes pre-project research and the design process itself. Information- logic diagram of the ergonomic clothing design model employees of the special force's detachment. Entrance In carrying out pre-project studies, the conditions are studied operation, as it is necessary to take into account the impact of hazardous and harmful factors (HFA), including external environmental factors, in which the fighter is located, the topography is established and analyzed wear of existing clothing samples, functional postures, movements performed by employees, and consumer preferences.

Based on the data obtained, reasonable requirements for materials included in the product package, to constructive solution and manufacturing technology. The process of designing ergonomic clothing for team members special purpose includes the following important steps: "development camouflage based on the analysis of the "color atmosphere" of the environment", providing increased camouflage capabilities of products, "assessment of heat-shielding characteristics and selection of a package of materials based on comparative characteristics of their heat-shielding ability", "developmental design of the designed product based on the mathematical model", allowing to obtain products with a high level of ergonomic compliance at the design stage, shortening the lengthy process design development. The presented information-logical design scheme ergonomic clothing for special forces personnel allows you to determine the type of work, sequence and relationship on every design stage. [5]

In accordance with the standards, special clothing must meet the following quality indicators: physical and mechanical (breaking load of the seam); ergonomic, including: hygienic indicators (mass, air permeability, seam stiffness), physiological (allowable time of continuous use), anthropometric (compliance with the size of the human body); reliability indicators (term service life, resistance to washing or dry cleaning); artistic aesthetic (silhouette, appearance, finish). In

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accordance with, the clothing of a special force's unit must satisfy the protective, hygienic, ergonomic, psycho physiological and aesthetic requirements, as well as a number of production requirements. To the clothes of the employees of the special detachment destination, a number of special protective requirements are imposed, since during while working, they perform certain functional duties, combining not only combat training skills, but and climbing tasks along with masking tasks to obstruct recognition adversary.

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