

Selection of Fabrics and Their Physical-Mechanical Properties for Designing Special Garments

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Annotation: In this article, the working conditions of the military personnel of the special unit were studied in detail before the design of camouflage clothing, and technical requirements were drawn up based on them. In the study of the working conditions of the special department workers, the physical and mechanical properties of the fabrics used in the design of special clothes were studied, taking into account the factors of production and their impact on the person, the severity of the work performed, the dynamics of the workers' movement.





Key words. Special clothing, design, material properties, service life, climatic conditions, camouflage fabric, air permeability, penetration of materials.

Introduction

Designing is a complex creative process that involves designing any item, including clothing. Clothing design means the complex of details and materials that make up clothes, as well as the methods and means of connecting them together and turning them into a single item of a certain size and shape. In the process of designing, it consists in creating volumetric details of the product and its image on the plane. The number of dimensions and shape of the parts give the same dimensions and appearance when they are assembled. In the design of clothes, the rules of taking measurements from the body and drawing the basic drawing of the article based on the measurements, and then making a pattern from the drawing are taught. Various institutions are engaged in the design of clothes. These are fashion houses, experimental workshops of sewing enterprises, special design offices, research institutes and laboratories. In clothing modeling, we teach how to create a clothing model and prepare a model from the basic pattern. In this case, model lines are inserted into the base drawing according to the sketch, and a new model template is created. In the artistic decoration of clothes, different decorations are given to the clothes depending on the type and function of the clothes, and the ways of decorating them are taught. It is clear that the selection of decorative elements is a creative process, depending on the assortment of clothes, the style of the clothes, and for whom the clothes are intended.

When choosing material for special clothing, protective equipment and the above features are taken into account. Clothing is not only a means of wearing, but the possibility of sewing fabrics in the production of tailoring, its use is served by its durability and convenience. In order to choose materials for the design of uniforms for military personnel of the special unit, their physical and mechanical characteristics were studied and analyzed based on the following tables and graphs.





Selected samples Table 1

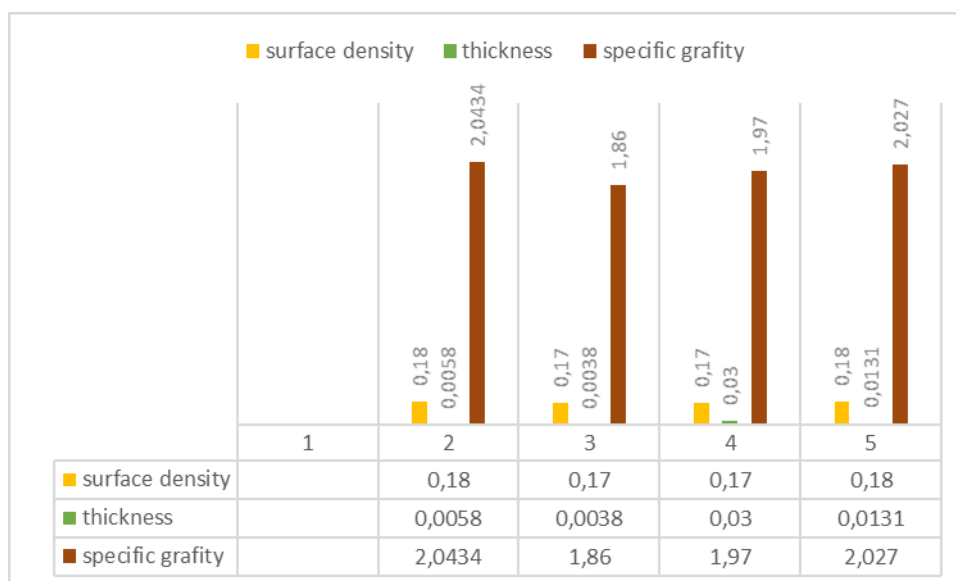
			
Sample 1	Sample 2	Sample 3	Sample 4

We measure the surface density, thickness, and specific gravity of the four selected samples and place them in the table and compare them using a graph.

Analysis of physical and mechanical properties of selected fabric samples

Table 2

NO	Indicator name	Selected fabric samples			
		I	II	III	IV
					
1	Surface density (gr/m^2)	0,18	0,17	0,17	0,18
2	Thickness (mm)	0,0058	0,0038	0,03	0,0131
3	Specific grafity (gr/sm)	2,0434	1,8608	1,97	2,027







According to the graphical analysis of the obtained results, we can see that the surface density, thickness, specific gravity of the samples is higher than the first one.

Breaking force - determined on different center breaking machines. For the test, three samples are taken for the body and the hem, and these samples must be of a certain size and the longitudinal threads in it must be intact. The width of the sample is 50 mm, the distance between the clamps is 100 mm for woolen fabrics, and 200 mm for other types of fabrics. The length of the sample is 100-150 mm longer than this distance. In order to reduce gas consumption, the sample width is 25 mm and the distance between the clamps is 50 mm. The shear force is determined in the direction of the body and the beam. The main quality indicator of fabrics is characterized by breaking strength. Tensile strength is the force used to stretch and break samples at a given size and speed. In the study, the tensile strength was measured according to the standard method, the length and width of the samples were 30x5 cm, and the results were obtained under the influence of force (800N) using the "YG026A" equipment for 30 minutes. The obtained results were calculated using the following formula (Table 2).

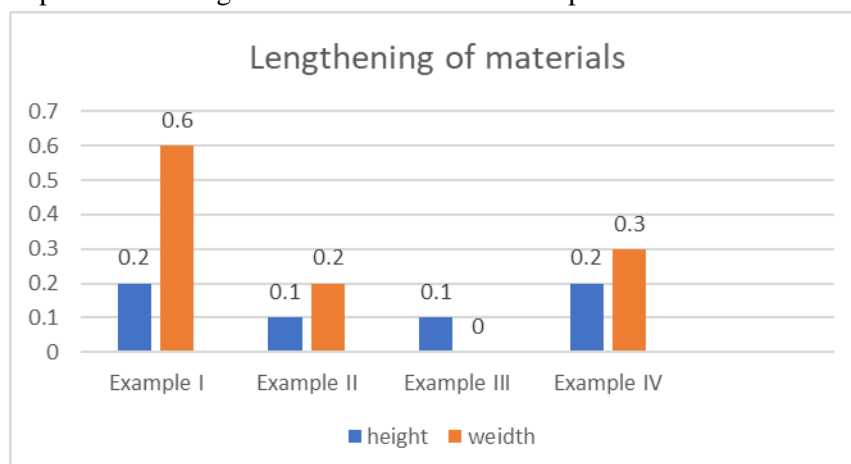
$$e = 100 (L_2 - L_1) / L_1 * 100$$

Here: initial length of sample L1, mm. The length of the L2 sample at break, mm

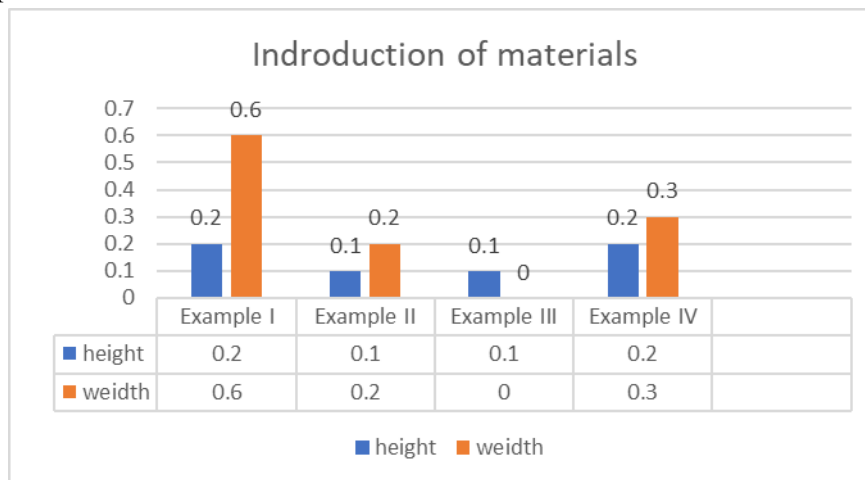
Table 3

Indecators		Selected fabric samples							
		I		II		III		IV	
									
		L (mm)	Foizda %	L (mm)	Foizda %	L (mm)	Foizda %	L (mm)	Foizda %
Lengthening of materials	height	0,3	1,5	0,27	2	0,4	2	0,3	1.5
	weidth	0,1	0,5	0,3	1,5	0,1	0,5	0,029	2
Introduction materials	height	0,2	2	0,1	0,5	0,1	0,5	0,2	2
	weidth	0,6	3	0,2	2	-	-	0,3	1,5

We use a graph to analyze our results based on the test experience. From the graph below, we can see that the third sample has less length and width than the other options.



In the next graph, we found that the penetration rate is high in the first sample, and the best option is the third sample.



Clothes are in direct contact with the body, and its quality is taken into account when designing a product. Therefore, it is necessary to determine the indicators of the fiber composition and physical properties of the gas.





The air permeability of gauzes is one of the hygienic indicators for special work clothes, and it is determined by the coefficient indicating the amount of air passing through 1 cm² of fabric in 1 second due to the pressure difference on both sides of the gauzes. Air permeability Tested on YG-461E device B(cm³/cm²sec) GB/5453 (ISO 9237) for ready-to-wear fabrics under normal conditions, pressure-100Pa, range size-8.0mm and determined using the following formula.

$$B = \frac{V}{S \cdot T} \text{ cm}^3 / \text{cm}^2 \cdot \text{cek}$$

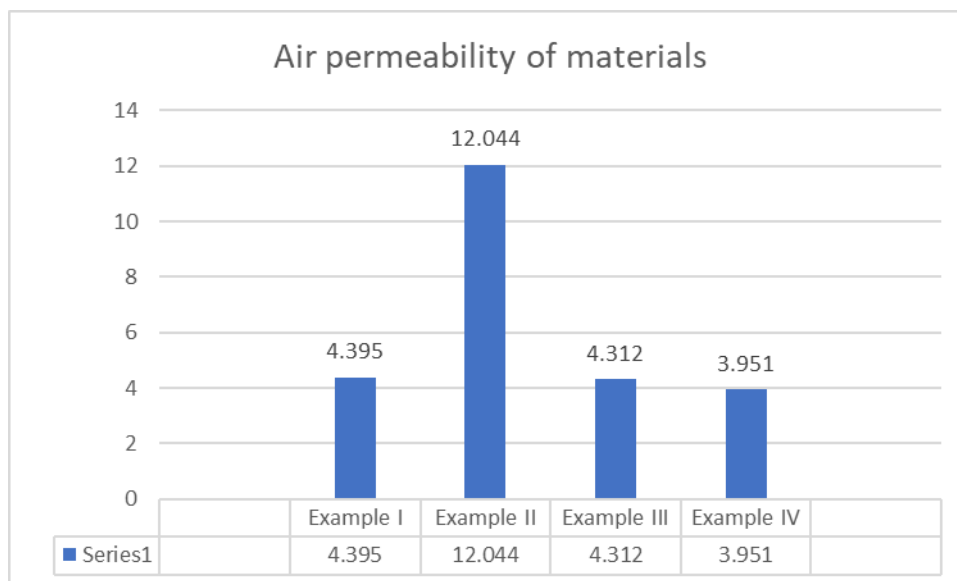
Here: V is the amount of air passing through the fabric due to the given pressure difference R, cm³; S - fabric area, cm cm²; Air passage time between the T-cloth, sec.

The air permeability of selected special fabrics is shown in the table below.

Table 4

Air permeability of materials cm ³ /cm ² * sec			
I	II	III	IV
			
4,395	12,0494	4,312	3.951

We will compare the air permeability of our material samples with the help of a graph.



According to the graph above, I can see that the air permeability of the material is high in the second sample.

Summary

In conclusion, the working conditions of military personnel of the special unit were studied when designing camouflage clothing. The physico-mechanical properties of gas samples selected for the design of special clothes were analyzed. Based on these obtained results, graphic analysis was carried out. Based on the analysis, it can be seen that the above material samples can be recommended for the production of special clothes.

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