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STUDY OF PHYSICAL-MECHANICAL PROPERTIES OF FABRICS USED FOR MEN'S OUTER KNIT ASSORTMENT

NABIDJANOVA NARGIZA NASIMJANOVNA

Professor of Namangan institute of textile Industry, Namangan, Uzbekistan
Phone: (0893) 671-0114, E-mail: nabidjanova74@mail.ru

AZIMOVA SAYYORA GULAMJANOVNA

Doctoral student of Namangan institute of textile Industry, Namangan, Uzbekistan
Phone: (0877) 277-7424, E-mail: sayyora_azimova@inbox.ru

*Corresponding author.

Abstract: The purpose of this scientific research is to study the physical and mechanical properties of rubber textile fabrics produced in our Republic for the development of men's outerwear collections based on the combination of usable residual waste of leather fabrics. In the "Textile Products Testing" laboratory of the "Knitting Technology" department of the Namangan Institute of Textile Industry, the technological parameters of the upper knitted fabrics made of various raw materials and their physical and mechanical properties were determined experimentally. Physico-mechanical properties of test samples were studied in the research laboratory of the institute on the basis of state standards. The results of the experiment were analyzed and textile fabrics for men's outerwear suitable for the modern fashion trend were selected. Based on the analysis of the high quality indicators of the physical and mechanical characteristics of the upper knitted fabrics produced in the Namangan region, the conclusions of the scientific research on the recommendation for the men's assortment were given.

Keywords: knitting technology, product testing, feature, quality, index, men's outerwear, flat knitting machine, experimental method, strength, sample, jacket, cardigan.

Introduction. Nowadays, men's, women's and children's demand for outerwear is increasing. According to the analysis of the results of marketing research, it was found that women's vests made of 100% synthetic fiber are widely used in domestic markets. Such products are not suitable for the climatic conditions of Uzbekistan. Despite the production of many types of mixed fiber upper knitted fabrics by our Uzbek scientists, it was found that assortments intended for men and children are mainly imported from foreign countries (Turkey and China) [1]. In order to overcome the above mentioned problems, it is necessary to study the physical and mechanical properties of the mixed fiber upper knitwear samples produced in our Republic on the basis of the standard and to expand the quality and cheap range of products suitable for the modern fashion trend based on the analysis of the selected fabrics.

Methodology. As a result of the conducted scientific research, several variants of acrylic+cotton, acrylic+spandex, polyester+cotton, acrylic+polyester and 100% acrylic fiber upper knitted fabrics were developed in the "Testing of Textile Products" laboratory, and air permeability - GOST 31410-2009 (40-100 for outerwear); breaking strength - GOST 28554 (at least 80 N); elongation to break - quality indicators such as GOST 28554 (up to 40% at 6N) were tested [2].

Results and discussions. The physico-mechanical properties of fabrics developed on a modern 12-class flat needle LONG XING 252 knitting loom were tested and analyzed. The results of the analyzes are presented in Table 1.

Table 1. Technological indicators of upper knitted fabrics.

No	Name of indicators	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	
1	Fiber content (%)	35%	94% acrylic		26%	49%	
		cotton	6%	100%	cotton	acrylic	
		65%	spandex	acrylic	74%	51%	
2	Surface density (gr/m ²)	214,5	468,1	488,3	707,6	577,8	
3	Color stability (50x30) cm	in the dry state	5	5	5	4	4
		in wet condition	5	5	4	4	4

Table 2. Physico-mechanical quality indicators of upper knitted fabrics.

No	Name of indicators	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	
1	Fiber content (%)	35%	94%		26%	49%	
		cotton	acrylic	100%	cotton	acrylic	
		65%	6%	acrylic	74%	51%	
		acrylic	spandex		polyester	polyester	
2	Air permeability (B sm ³ /sm ² ·sec)	72,6	65,5	65,5	82,1	58,3	
3	Breaking strength P (H)	By height	828	798	731	986	931
		By width	791	635	628	511	791
4	Elongation of fabric at break L (%)	26	31	36	26	46	
5	Thickness (mm)	2,1	2,1	1,9	4,1	2,1	
6	Peeling, piece /10sm ² (10x12) sm	5/10 sm ²	22/10 sm ²	14/10 sm ²	4/10 sm ²	13/10 sm ²	
7	Abrasion resistance (t cycle)	26000	26000	26000	30000	28000	

From the above tables 1,2, it can be observed that the denser the surface of the fabric is, the more its thickness increases. It can be seen that samples 1 and 2 were evaluated positively during the test of color fastness in dry and wet conditions. The air permeability index of sample 4 is much higher than that of sample 1, while samples 4 and 5 are stronger in length, while samples 1 and 5 are stronger in width. The 2nd sample was positively evaluated for peeling, while the 4th sample was evaluated as resistant to friction [3-5].

If we conclude from this, it was justified that it is possible to develop a design project of men's quality outerwear from mixed fiber knitted fabrics compared to 100% acrylic.

Table 3 below shows the developed woven fabrics and their graphic notation.

Table 3. Physico-mechanical quality indicators of upper knitted fabrics.

No	Appearance of woven fabrics	Composition of used raw materials (%)	The name and graphic inscription of textile fabrics	Type of clothing used
1 [1]		35% cotton 65% acrylic	Rubber fabric 	Jacket, long cardigan
2 [1]		94% acrylic 6% spandex	Rubber fabric 	Hooded cardigan, jacket, long cardigan
3 [1]		100% acrylic	Patterned fabric 	Cardigan without hood, men's sweater
4 [1]		26% cotton 74% polyester	Rubber fabric 	Jacket, long cardigan
5 [1]		49% acrylic 51% polyester	Rubber fabric 	Jacket, pants, long cardigan
6 [3]		PAN 35x2	Patterned fabric 	Modern jumpers
7 [3]		PAN 35x2	Patterned fabric 	Modern jumpers
8 [4]		50% cotton 50% polyester		Modern jumpers

Table 3 above shows (some) knitted fabrics developed on the 12th class flat needle knitting machine LONG XING 252 in the test laboratory at the Namangan Institute of Textile Industry, the names and graphic notes of the fabrics, and their From the optimal options, it is recommended to produce men's outerwear.

Conclusions. Based on the analyzes of the physical and mechanical properties of the upper knitted fabrics on the basis of patterns and rubber, which are produced in the laboratory of "Testing of textile products" under the "Knitting Technology" department of the Namangan Institute of Textile Industry, consisting of (some) different raw materials, the optimal option it was recommended to produce men's outerwear from the samples.

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