Academicia Globe:
Inderscience Research

ISSN: 2776-1010 Volume 3, Issue 4, Apr, 2022

COMPARATIVE ANALYSIS OF THE QUALITATIVE CHARACTERISTICS OF NATIONAL FABRICS

Valieva Zulfiya Fahritdinovna
PhD, Assistant Professor

Tulanov Shamsidin Erkaevich
PhD, Assistant Professorn

Prozorova Olga Viktorovna
PhD, Assistant Professorn

Jumaniyazova Zulfiya Rashid kizi
Leading specialist of the testing laboratory
II-year student of group 8p-20 Tashkent Institute of Textile and Light Industry Tashkent Institute of Textile and Light Industry, Tashkent, Uzbekistan, zulfiya-valieva-76@mail.ru

Abstract:
Fabrics should protect a person from the harmful effects of the external environment, including atmospheric influences, create normal conditions for life, be harmless (fibers and preparations applied to the fabric should not emit harmful impurities) and create maximum comfort when worn. Therefore, close attention is paid to the hygienic properties of fabrics, which are indicators of the safety of textile and light industry products in accordance with the technical regulation "On the Safety of Light Industry Products". The article presents the results of studies of the influence of the fibrous composition of dress fabrics on their hygienic properties.

Keywords: dress fabric, breathability, hygroscopicity, electrification, surface density.

Introduction

Khan atlas has a complex manufacturing technology. The pattern is made up of pre-dyed silk threads. To do this, they are tied in bunches and dipped into the dye, getting an uneven color. The traditional size of the Uzbek loom makes it possible to produce fabric up to 90 cm. This technology is called ikat in the world, in Uzbekistan it is called abr (cloud). Each piece of material produced by the artisan has its own unique ornament. First, silk threads are dyed with natural dyes, which are made from onion peel, pomegranate peel, madder, extracts from the roots and stems of plants. Then a pattern is applied to the threads and only then they are connected into a fabric as shown in Fig. 1.

Academicia Globe:
Inderscience Research

ISSN: 2776-1010 Volume 3, Issue 4, Apr, 2022

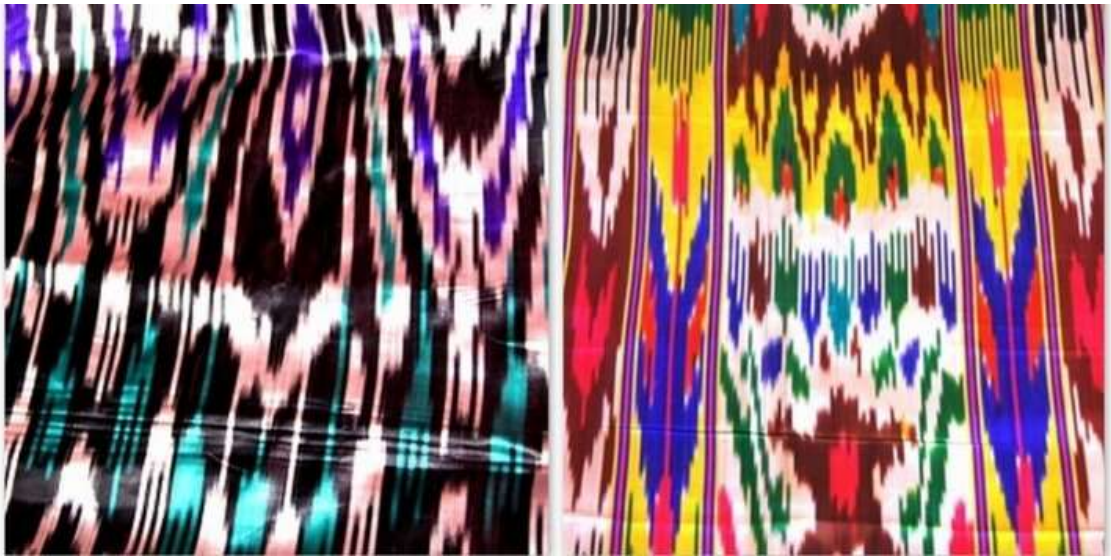

Fig.1. Abr fabric production technology

Academicia Globe:
Inderscience Research

ISSN: 2776-1010 Volume 3, Issue 4, Apr, 2022

Dense durable fabric with a silky noble sheen. It has two sides - a smooth front and a matte back. Literally translated from Arabic, the word "atlas" means "smooth". Indeed, it is a smooth, dense fabric with a shiny surface (Fig. 2.). The glossy effect is achieved due to the special satin weave of the fabric threads.

The special sheen of the fabric is obtained thanks to a special weaving technology. Satin weave consists of warp and weft threads (horizontal transverse lines of weaving). The main thread often goes to the face of the fabric, bends around five or more weft threads.

The silk thread consists of long and very smooth fibers, which means it does not irritate sensitive human skin. Their appearance (surface smoothness, gloss, natural color) and properties depend on the fibrous composition of fabrics: strength, elongation, elasticity, thermal conductivity, hygroscopicity, shrinkage, and others. Knowledge of the composition of fabrics and the properties of the fibers from which they are made makes it possible to determine the purpose of fabrics, their behavior in the process of making clothes and its operation (sliding of fabrics during cutting, shedding and spreading of threads in seams, shrinkage, crease resistance, dimensional stability, and others), as well as modes of wet-thermal cutting of garments.

Fig.2. Appearance of satin fabric

The main hygienic properties of fabrics are:

Hygroscopicity is the property of a fabric to change its moisture content depending on the humidity and ambient temperature. This is one of the most important properties of fabrics. If the moisture content of the fabric did not change with changes in temperature and humidity, then the hygroscopic properties of fabrics would lose their hygienic significance. Fabrics with a certain hygroscopicity are the regulator of heat between the human body and the environment. This is one of the most important properties of fabrics.

The hygroscopicity of fabrics is characterized by the normal moisture content of the fibers of which it consists, i.e. fiber moisture under normal conditions. Cotton and linen fabrics, fabrics made from natural silk and hydrated cellulose fiber have the best hygroscopicity. Woolen fabrics, although they have significant hygroscopicity, absorb moisture and evaporate slowly. The rate of absorption and

ISSN: 2776-1010 Volume 3, Issue 4, Apr, 2022

return of moisture depends not only on the hygroscopicity of the fibers, but also on the structure of the fabric. The denser and thicker the fabrics, the slower they absorb and release moisture and the better they ensure the constancy of the humidity and temperature of the air gap between clothing and the human body. Fabrics made of synthetic fibers have low hygroscopicity.

Breathability is the property of a fabric to allow air to pass through to ensure ventilation of clothing. The breathability of fabrics depends on the presence of pores, which are larger in thin, low-density and unfinished fabrics, and less in thick, dense, finished fabrics. The penetration of air through the fabric depends on the speed of human movement or wind speed [1, 4].

Electrizability is the ability of materials to accumulate static electricity on their surface. When textile materials are rubbed on their surface, two processes occur simultaneously: the process of the occurrence of static electricity charges of a certain polarity and the process of dissipation of charges. When the balance between these processes is disturbed, electrification occurs. The electrification of textile materials has daily and seasonal fluctuations associated with the ionization of the atmosphere. For example, in summer, the electrification of materials is higher, since solar activity is stronger during this period. In most cases, the electrification of textile materials is a negative phenomenon: it complicates the technological processes for the production of materials and the manufacture of garments from them. It is known that a positive electric field on the surface of human skin causes a number of pathological reactions. A negative electric field has a beneficial effect on the body. For example, the high electrification of chlorine is used to make medical underwear. The high electrical resistance of textile materials contributes to the accumulation and retention of static charges on them for a long time. Electric fields from excess charges on objects, clothes, the human body put a heavy load on the human nervous system, and the cardiovascular system of the body is also sensitive to electrostatic electric fields. As a result of wearing electrified clothing, a person acquires a charge and is under the influence of the field created by this type of textile material. This is a very harmful and unpleasant factor, the impact of which should be avoided or reduced [2,3].

To study the effect of the fibrous composition of fabrics on their hygienic properties, the selected samples were determined structural and physical indicators using modern equipment of the Centeuz laboratory at TITLP, regulated in the general technical regulation "On the Safety of Light Industry Products". Fibers such as viscose, wool and cotton have a high moisture absorption capacity (at a given relative humidity of the environment, their fibers absorb more moisture than other materials) and a small electrostatic charge [5]. Polyester and polyacrylonitrile fibers have low moisture absorption capacity and high electrostatic charge [6]. With an increased moisture content on the surface of the material or in the fibers themselves, the electrical conductivity of the tissue increases, which allows it to remove the charge [5].

The traditional khan atlas has a fairly high price associated with its production. In order to make the fabric more affordable and more durable in operation, cotton, viscose and synthetic fibers are used as weft. Polyester is added so that the performance properties of the fabric are at a high consumer level, so that the fabric does not lose its color when washed, does not fade in the sun and is more wear-resistant. Viscose gives a good appearance and good consumer properties. It also affects the tissue

ISSN: 2776-1010 Volume 3, Issue 4, Apr, 2022

parameters that were examined.

It also affects the tissue parameters that were examined. Four samples of khan-atlas with different fibrous composition were selected.

The results of physical and mechanical characteristics are shown in table 1.

According to the obtained tissue indicators, taking into account the positive and negative quality indicators, a comprehensive assessment was made and a diagram of comparison of quality indicators was built, shown in Fig. 3. A complex (radar) chart is an excellent tool for displaying the functional relationship of three or more variables. This provides a visual representation in a good form for comparing certain trends. Radar charts are used to compare the statistical values of several data series. This type of chart is displayed as a curvilinear polygon with vector lines coming out of a common center. These vector lines are the coordinate axes for each of their categories. The results of a comprehensive assessment of national fabrics are shown in Table 2

table 1Physical and mechanical characteristics of khan-atlas fabrics different fibrous composition

№	Name of indicators	Unit of measurement	100% natural silk	Basis natural silk Weft artificial fiber (viscose)	Basis natural silk Weft synthetic fiber	100% synthetic fiber
			Sample I	Sample II	Sample III	Sample IV
1	Surface density	g/m²	144,1	133,2	143,7	135,2
2	Thickness	mm	0,25	0,29	0,20	0,15
3	Number of threads per 10 cm based by duck		750 460	630 340	650 370	340 280
4	Weave		Satin	Satin	Satin	linen
5	Breathability	sm³/sm·sek	4,81	32,7	3,61	11,48
6	Hygroscopicity	%	4,9	6,8	4,3	2,8
7	Electrification	V	236	258	361	721

Academicia Globe:
Inderscience Research

ISSN: 2776-1010 Volume 3, Issue 4, Apr, 2022

table 2. Mass of polygons of samples obtained from complex evaluation

№	Sample type	Mass of samples, gr
1	Sample I	0,317
2	Sample II	0,438
3	Sample III	0,245
4	Sample IV	0,249

According to the analysis of the results in the complex assessment: sample II (the base is natural silk, the weft is artificial fiber (viscose)) by weight has a significant indicator relative to other samples.

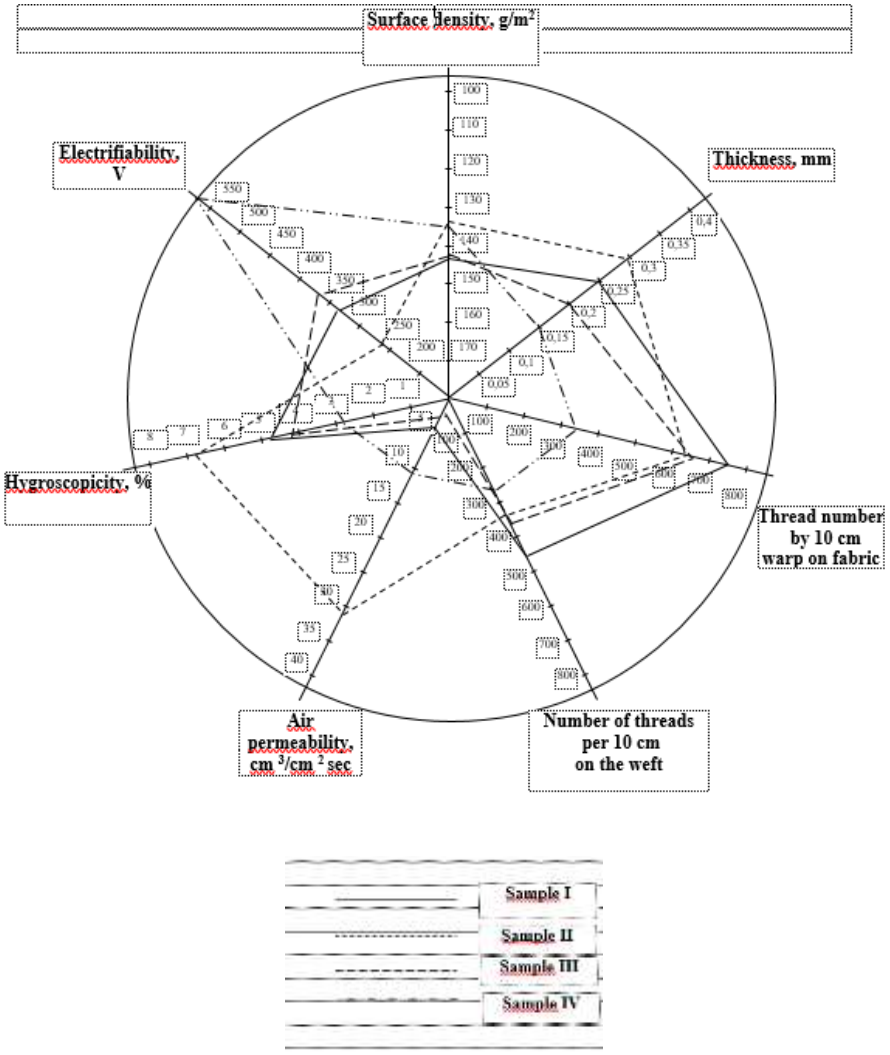

Fig.3 Comprehensive assessment of khan-atlas fabrics

ISSN: 2776-1010 Volume 3, Issue 4, Apr, 2022

References

1. Decree of the Cabinet of Ministers of the Republic of Uzbekistan № 148 of 11.05.2016 "General technical regulations on the safety of light industry products".
2. GOST 3816-81 (ISO 811-81) "Textile fabrics. Methods of determination of hygroscopic and water-repellent properties".
3. Zhernitsyn Yu. L., Gulamov A. E. Methodological instructions on the implementation of research and laboratory work on testing textile products. Tashkent. 2007г.
4. Under the editorship of Prof. A.N. Neverov "Merchandising and examination of industrial goods": Textbook /. - M.: MTSFER, 2006. - 848 c
5. Khabalashvili N.M. Research of electrostatic properties of clothing textile materials in relation to operating conditions // Dissertation of Candidate of Technical Sciences - Moscow: 1978-162s.
6. N.A. Savostitsky "Materialovedenie sewnogo proizvodstva" Izd. "Mastery", 2000.
7. Solov'ev A. N., Kiryukhin S. M. "Evaluation and forecasting the quality of textile materials" M.: Light and food industry.1984.
8. Tamm I. E., Fundamentals of the Theory of Electricity, 9th ed., M., 1976; Kalashnikov S. G., Electricity, 3rd ed., Moscow, 1970 (General Course of Physics, vol. 2).
9. Bukina Y.A., Sergeeva E.A. "Methods of quality control of textile materials. Determination of physical and mechanical characteristics and surface properties." Bulletin of Kazan Technological University. Vol.15 №11, -2012, p. 49-55
10. OST 20566-75 Fabrics and piece products textile. The rules of acceptance and sampling method.
11. GOST 21790-2005 Fabrics of cotton and mixed clothing. General specifications.
12. GOST 29223-91 "Suit, dress and suit fabrics of chemical fibres. General specifications".
13. GOST 28253-89 "fabrics of silk and half-silk dress and dress-costume. General technical conditions.