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RESEARCH OF PRODUCTION OF KINDERGARTEN CHILDREN'S CLOTHES ON THE BASIS OF ANALYSIS OF KNITTED FABRICS WITH HIGH PHYSICAL AND MECHANICAL PROPERTIES

Abstract: This article examines the aesthetic requirements of kindergarten children's clothing, the types of fabrics used in them, the composition of raw materials, physical and mechanical properties, analyzes the range of uniform and combined fabric outerwear in the production of children's clothing made.

Key words: glad, jeans, model, analysis, knitting, fabric, test, combination, raw material, polyester, polyamide, lycra, model, durability, physico-mechanical, brand, fittings.

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Introduction

High-quality children's clothing reliably protects the child's body from the harmful effects of the environment, is comfortable, safe and secure, provides him with psychological comfort and contributes to normal physical, mental and artistic development, as well as its production and sale is economical should be purposeful in terms of. In the production of children's clothing, the fabric chosen in the first place should not only be a means of protection for children, but also serve to improve their oxygen circulation. Second, a child's worldview is radically different from an adult's.

The bright colors of the fabrics allow children to quickly develop their range of reception. The softness

of the fabric protects the body from sweating and does not transmit sunlight to the body, which also has a positive effect on the growth of the baby. Attention is also paid to its lightness, toughness, compatibility with body temperature. In the range of clothing for children, the first priority should be in the form of simple designs based on hygienic comfort and stability of movement during their development [1].

It is an important task to meet the growing demand of our people at the expense of quality products made in our country, researchers of light industry, as well as clothing companies, home-based workers, family entrepreneurs are working together. All quantitative and qualitative parameters of the planned product are determined at the initial design

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stage. But the design and industrial production of children’s clothing is a more difficult task compared to adult clothing for a number of reasons. In the formation of children's wardrobe, the process of sewing and sewing each item requires a lot of responsibility and attention.

Care should be taken when choosing a fabric for kindergarten-age children's costumes, because the

main thing is not the bright colors and creative design, but the quality of the raw material in its fiber composition. Fabrics for children's clothing are in constant contact with their delicate and sensitive skin, so they have special requirements (Table 1).

High-quality fabrics sewn into children's clothing have the following characteristics.

Table 1. Fabric requirements

№	Requirements	Features
1.	Hygienic safety	The fabric should not cause irritation, redness of the skin and other manifestations of allergies.
2.	Mechanical safety	Power. The higher the density of the fabric, the longer the life of the product.
3.	Convenience	Man and clothing have a soft, pleasant effect on the body during the process of function.
5.	Hygrosopicity	Facilitate the washing and drying of the garment by absorbing a high level of moisture.
6.	Air permeability	The fabric maintains the "circulation" of oxygen in the delicate body and does not cause excessive sweating.
7.	Color fastness	Children’s clothes are washed several times more often than adults, and products can fade over time and lose their brightness.

Traditional fabrics with natural properties are widely used in the production of children's clothing. According to modern market marketing analysis, denim jeans and knitted fabrics are one of the most

popular options in the children's wardrobe today, and flannel, corduroy, ribbon, and plaid fabrics are the most suitable choices for the age group.



Picture: 1. Girls' clothes

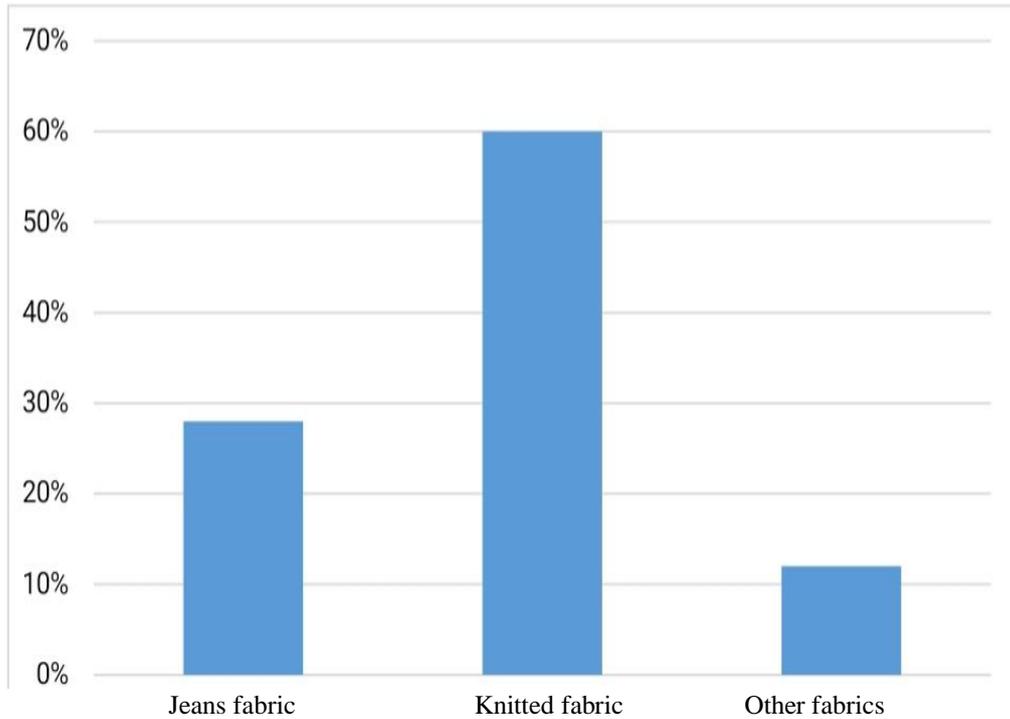


Picture:2. Boys' clothes

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Marketing analysis shows that today in the foreign and domesticates there is a high demand for

modern types of children's clothing in knitted and denim fabrics (Picture 3).



Picture 3. Fabrics with high demand

Wear of clothes during operation is a process in which the physical and mechanical properties of fabrics deteriorate.

Natural fabrics, in addition to all the positive qualities, also have disadvantages - they quickly wear out and quickly lose their appearance. Physical and mechanical properties of fabrics include the properties of the product, such as strength, durability, shrinkage. The mechanical properties of natural fiber fabrics are not high. Therefore, chemical fibers such as polyester, polyamide, elastane or nylon are added to them.

Knitted fabrics produced in the industry are divided into 2 groups: for underwear and for outerwear. The first group of fabrics is used for

sewing men's and children's shirts, underwear and pants, warm shirts, women's underwear, sports suits and more.

The advantage of knitted fabrics is their softness, abrasion resistance and high elasticity. It is easy to wear clothes made of knitted fabrics, it does not compress the body. They have high curvature, no wrinkles, heat retention and hygienic properties.

Depending on the type of raw material used, knitted products are divided into the following types: cotton fiber, wool and mixed fiber yarns, chemical fibers, synthetic, artificial yarns, yarns and yarns (Table 2).

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Table 2. Analysis of raw materials and assortment of garments.

№	Raw material	Knitwear
1	2	3
1	From natural and chemical raw materials Cotton Cotton + polyester Wool and half wool Synthetic fibers Synthetic fibers Mixed	Knitwear: - Jumper, sweater - Jacket "Nimcha." "A shirt." - Suit "Shim, pajamas." - Gown, blouse - Hairstyles - Sundresses
2	Cotton, cotton + elastic yarns Viscose + silk Cotton, lavsan + elastic yarns Made of cotton, lavsan + wool fibers	Assortment of sports underwear: - Fufayka - T-shirt - Swimsuits
3	Cotton Cotton + viscose Artificial Half wool	Internal knitwear: - Rasposhonka - Polzunka and chepchik - Overalls - Envelopes

Depending on the type of raw material used, knitted products are divided into the following types: cotton fiber, wool and mixed fiber yarns, chemical fibers, synthetic, artificial yarns, yarns and yarns.

The physical and mechanical properties of knitted fabrics have a great influence on its properties and determine the environment in which the product is made.

The mechanical properties of knitted fabrics indicate their response to various forces. These forces can be large or small, and can act once or repeatedly.

The forces can act on the length, width, or angle of the fabric. As a result, the fabric bends, stretches, twists and other deformations.

According to Professor GN Kukin's classification, the mechanical properties of fabrics are divided into three classes - semi-circular, single-period and multi-period. "One period" means that the fabrics are subjected to force (loading), unloading (unloading) and resting (resting). The single-cycle class takes into account the effect of the fabric on the force and the change in the structure of the material before it leaves.

Semiconductor mechanical properties include tensile strength, elongation at elongation, work done at elongation, relative tensile strength, and more. These properties are used to indicate the absolute mechanical capacity and quality of the fabric [2,3].

The tensile strength of fabrics is the tensile strength used to break specimens. It is denoted by the letter "P" and is expressed in Newton (N) units. The tensile strength indicates the strength of the fabric. The strength of materials depends on their fiber content, the structure of the yarns and the linear density, weave, density, type of finishing. The thicker and denser the threads, the stronger they are. Finishing processes, such as pressing and embossing, increase the strength of fabrics, while bleaching and dyeing reduce the strength of fabrics.

The tensile strength and tensile elongation of knitted fabrics are determined on the dynamometer AUTOGRAPH AG-1 (standard JIS L-1096, ISO 5081-5082) in accordance with the requirements of GOST 8847-85 [4,5].

Table 3.

№	Brief technical description of the tool	
1.	Test object	various fabrics, knitted fabrics, spun yarns
2.	Clamps distance between	5÷50 sm
3.	Unit of measurement	Newton

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4.	Measuring range	0.1: 1000 N
5.	Removable indicators	breaking strength elongation at break, variatsia coefficient, variance, etc.
6.	Measurement accuracy	+0.1 N
7.	Overall dimensions (width, length, height)	660x520x1580mm
8.	Energy source:	220 V, 50 / 60Gs.

The AG-1 instrument is used to measure the breaking characteristics of fabrics, yarns and other textile products.

Knitted fabrics were tested in the laboratory "Test of textile products" of the Namangan Regional Center for Standardization and Certification.

Despite the variety of knitted fabrics and the wide range of possibilities of knitting machines, one of the most common fabrics is glad knitwear. Glad knitted fabric is light and quickly deformable, and the product from this fabric quickly loses its shape under

the influence of force. The solution to this problem is to increase the shape of the fabric by adding lycra yarn to the glad knit fabric. The following is an analysis of the changes in the physical and mechanical properties of the glad fabric when woven from 20-text melange yarn and 100% cotton yarn, as well as cotton yarn with different amounts of lycra yarn. To determine the tear characteristics of the fabric according to the standard, samples were prepared by cutting the length and width of 300x50 mm glknitted fabrics (Figures 4-a, b, c).



Picture 4. Test laboratory

The prepared samples were placed between the clamps and the START button was pressed so that the distance between them was 200 mm. The upper bouts featured two cutaways, for easier access to the higher

frets. After the fabric is torn, the results are displayed on the computer screen in the form of graphs and tables.

Table 4. Technological parameters and physical and mechanical properties of glad knitwear

Indicators	Options				
	I	II	III	IV	
The amount of lycra in the fabric	0	2,8	4,2	0	
Surface density, Ms g / m2	139,8	142,7	156,4	141,1	
Thickness, T mm	0,38	0,42	0,46	0,38	
Air permeability, V cm3 / cm2 sec	158,7	122,9	83,3	152,4	
Friction resistance, I thousand circles	12,5	16,0	18,7	14,2	
Breaking force P, N	along	149,4	160,9	187,3	152,1
	across	127,2	136,0	156,3	134,6

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Elongation at break L,%	along	61,6	79,2	94,0	71,7
	across	92,1	120,5	154,2	95
Irreversible deformation, en%	along	38	19	10	36
	across	45	11	3	42
Reversible deformation, e0%	along	62	81	90	64
	across	55	89	97	58
Introduction, U%	along	8,5	11,5	15	8,0
	across	4,5	2	1,5	4,0

In the first variant of glad knitwear, 100% cotton is made of cotton yarn. Option II added 2.8% lycra, and variant III added 4.2% lycra. Option IV is made of melange yarn. It can be seen from the table that the addition of lycra yarn increases the abrasion resistance, tensile strength, elongation and re-deformation properties of the fabric. This knitwear improves the shape and quality of the fabric.

Conclusion

The results of the research show that the physical and mechanical properties of fabrics are very

important in the production of competitively knitted children's clothes in terms of low cost and high design efficiency, given the high productivity of the garment company. Demand for high-quality, low-stretch, shape-retaining high-end knitwear is higher than ever.

It is recommended to produce children's outerwear, taking into account the characteristics of the glad knitted fabric analyzed above.

References:

1. Abdullayeva, K.M. (2006). "Fundamentals of design and modeling of garments". Tashkent.
2. Abbasova, N.G., & Ochilov, T.A. (2010). "Gas engineering". Tashkent.
3. Matmusayev, U.M., Qulmatov, M.Q., & Ochilov, T.A. (2013). *Materials Science*. Study guide. "ILM ZIYO". Tashkent.
4. Nabidjanova, N.N. (2008). "Design and development of a new range of cotton and silk knitwear". Tashkent.
5. Soderlund, M., & Ohman, N. (2006). Intentions are plural: Towards a multidimensional view of intentions in consumer research. *European Advances in Consumer Research*, vol. 7, pp. 410–416
6. Kock, N. (2011). Using Warp PLS in e-collaboration studies: Mediating effects, control and second order variables and algorithm choices. *International Journal of e-Collaboration*, vol. 7, issue 3, pp. 1–13.
7. Nunally, J. C. (1978). *Psychometric theory*, 2nd edition, McGraw Hill: New York.
8. Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, vol. 16, issue 1, pp. 74–94.
9. Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, vol. 48, pp. 39–50.
10. Jewell, D. V. (2011). *Guide to evidence-based physical therapist practice*, 2nd edition, Jones & Bartlett Learning: Ontario.
11. Mersey, R., Davis, E., Malthouse, C., & Calder, B. J. (2010). *Engagement with online media*. In: *Journal of Media Business Studies*, vol. 7, issue 2, pp. 39–56.