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RESEARCH ON PHYSICAL AND MECHANICAL PROPERTIES OF FABRIC SELECTED FOR SPECIAL CLOTHING OF PRESCHOOL CHILDREN

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Abstract: This article discusses the research on physical and mechanical properties of fabrics and clothing proposed for preschool children to protect them from operational impacts and prevent contamination. The purpose of proposing special clothing is to consider the health and comfort of young children.

Keywords: water absorption, physical-mechanical, fabric, special, fiber composition, abrasion resistance, moisture resistance.

Introduction. In accordance with the Resolution of the President of the Republic of Uzbekistan No. PQ-3955 dated September 30, 2018, "On measures to improve the management of preschool education system," the focus is on further improving the preschool education system, strengthening its material and technical base, expanding the network of educational institutions, radically improving children's preparation for school education, and creating conditions for comprehensive intellectual, moral, aesthetic and physical development of children. This demonstrates the significant attention being paid to preschool education and youth development. Currently, providing children with safe products is one of the main tasks of our government. The health and future achievements of the young generation depend on the solution to this task. Clothing for preschool-age children stands out for its uniqueness. At this age, children's clothing should not only be comfortable in all aspects but also should not harm their health.

Materials and methods. The physical and mechanical properties of fabric intended for children's special clothing were studied in this research. The fabric was selected after studying several requirements for preschool children's clothing. The special clothing is primarily designed for children aged 4 to 7 years in preschool educational institutions. The recommended fabric is used to produce clothing worn during painting activities and meals. The main purpose of creating special clothing is to protect children's clothes and body parts from various external contaminations and reduce the use of chemical agents in washing. This helps protect children from various skin diseases and excessive exposure to chemical substances.

To study the physical and mechanical properties of the recommended fabric accurately and reliably, the materials were tested and analyzed at the testing laboratory

complex of the "Uzbekistan Scientific Testing and Quality Control Center" State Institution in Tashkent.

The physical and mechanical properties of the fabric were studied using the following measuring instruments and testing equipment (Table 1):

Table 1. Names of Measuring Instruments and Testing Equipment

Name of Measuring Instruments and Testing Equipment	Type of measuring instruments and testing equipment	Comparison and calibration information
Multi-functional tensile testing machine	Model "MT 120-10-01-01"	UZ 06/2400-2023
Martindale method for determining textile fabric abrasion, hairiness and pilling	Model "HA-511MC"	104-25-65-2023
Equipment for determining textile materials' water resistance	GT-C26A	2084.EMI30
Automatic equipment for determining fabric linear variability	GT-D34	1046431-2024
Wet and dry rubbing colorfastness tester	Crockmetr	1043906-2023
Washing colorfastness and chemical cleaning equipment	GT-D07	UZ-09T/1319-2023
Drying cabinet	BINDER. FD 115	UZ-09T/1883-2023
Surface electrical resistance meter	MT-420	1042913-2023

Using the above equipment, the physical and mechanical properties of the fabric were investigated (Table 2). The fabric's abrasion resistance, breaking strength, wet and dry rubbing resistance, and water resistance were studied.

Results and discussion. The following table shows the physical and mechanical properties of the fabric.

Table 2. Physical and mechanical properties of the fabric

Test Type	Test Methods According to Standards	Test Results
Breaking Strength N	ГОСТ 3813	495.3N, 346.2N
Water Resistance	ГОСТ 3816	452 mm
Dimensional Change After Wet Processing	ГОСТ 30157.0-95 ГОСТ 30157.1-95	0%

Surface Density of Finished Fabric	ГОСТ 3811	69.02 g/m
Color Fastness	ГОСТ 9733.1-91	Washing: 4/4b Distilled water: 4/4b Dry rubbing: 4/4b Wet rubbing: 4/4b Ironing: 4/4b Organic solvents: 4/4b
	ГОСТ 9733.4-83	
	ГОСТ 9733.6-83	
	ГОСТ 9733.7-83	
	ГОСТ 9733.27-83	
Fiber Composition %	ГОСТ ISO1833-1-2011 ГОСТ ISO1833-11-2011	100% Synthetic
Electrical Resistance	ГОСТ 19616-74	2.9x10 ⁹
Electrostatic Voltage	ГОСТ 32995-2014	0.62 kV/m

Using the latest technology, the physical and mechanical properties of the fabric recommended for special clothing (Table 2) were studied. The research revealed several advantages of the fabric. Specifically, this fabric is water-resistant, quick-drying, prevents various stains and dyes from transferring to the body, and maintains its shape after wet processing. All properties of the recommended fabric are suitable for the intended clothing. This is because special clothing for preschool children should be abrasion-resistant, comfortable, protected from colors and dyes, stain-resistant, and water-resistant.

Conclusion. In conclusion, the proposed fabric underwent laboratory testing. The results were analyzed, and the physical and mechanical properties of the fabric are suitable for special clothing recommended for preschool children. Additionally, the quick-drying feature of the fabric is an important factor in any season. It protects children's daily clothes and body from colors, dyes, and contamination. All physical and mechanical properties of the fabric were found to be appropriate for special clothing.

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