# STRUCTURAL STUDY OF ELECTRICAL CONDUCTIVE FABRIC

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**ABSTRACT**
This article is woven by adding polyester fiber at intervals of every 10 mm to obtain an antistatic fabric. Polyester fibers with linear densities of 7.5x2 and 9x3 texture were used on the body and back. The density of the fabric on the body is 600 + 3 n / dm, the density on the back is 160 + 3 n / dm. The following properties of fiber were used in the fabric as an electrically conductive additive: cotton - 60%, conductive fiber (EO'T) - 40%, linear density - 50 tex, specific tensile strength - 9 sN / tex, elongation at break - 14%, linear electrical resistance - 18-20 km / m. The quality indicators of the obtained electrically conductive fabric were determined.

**KEYWORDS:** conductive fabric, friction resistance, strength, heat resistance, conductivity, conductive cord, air permeability, antistatic properties, electro physical properties, electrostatic potential

New high-tech jobs will be created in the textile and garment industry of the Republic due to high and stable growth rates, attraction and development of foreign direct investment, production and export of competitive products, implementation of strategically important modernization projects. Systematic work is being carried out to further deepen the structural reorganization, aimed at the creation, technical and technological modernization of enterprises, the introduction of an advanced "cluster model". At the same time, a comprehensive analysis of the development of the textile and clothing industry, the changing world market conditions in the face of increasing competition requires government support for the industry, as well as the development and implementation of more sustainable and dynamic development mechanisms.

In today's market economy, one of the most important directions in the work of textile and light industry is to increase the range of products, improve their quality, and introduce new scientific and technical innovations to increase the demand for household products and technical materials.

At present, along with the improvement of the technology of obtaining polymeric materials, research is being conducted to increase the specific properties of these materials: temperature resistance, high strength, electrical conductivity and other properties. One of these types of materials is an electrically conductive material. This type of material has the properties of metals, high electrical conductivity, lightness, elasticity and other textile materials.

Electrically conductive materials are used in various sectors of the economy. The most widely used area of this fiber is in the production of these antistatic and electrifying materials. This type of fabric is used to sew special protective clothing for those who work in areas with high electrification. Materials that contain electrically conductive fibers are lightweight and flexible.

Currently, the production of polymeric materials (plasma fibers, films) is growing. At the same time, technology is being developed to give them high strength, heat resistance, electrical conductivity and other similar properties in their manufacture. One such material is electrically conductive chemical fibers. They have the high electrical conductivity inherent in metals and the elasticity inherent in chemical fibers. The conductive chemical fibers exported to the world market differ in the chemical nature, composition of the electrically conductive components used in their manufacture, their distribution or distribution throughout the polymer mass, and the methods of obtaining them. Despite the high cost of these yarns, the demand for them is growing as the areas in which electrically conductive fibers are applied are expanding.

Air permeability represents the air permeability of textile fabrics. It is one of the indicators of the hygienic and heat retention properties of fabrics in the production of clothing. Studies have shown that the conductive yarn structure is more brittle than pure cotton yarn, which leads to high air permeability of the fabric sample. The air permeability of the conductive fabric is 29.5cm3 / cm2 • s.

Of particular interest in the operation of electrically conductive fabric is its abrasion resistance. A study of this property of electrically conductive fabric shows that fabric composed of electrically conductive.

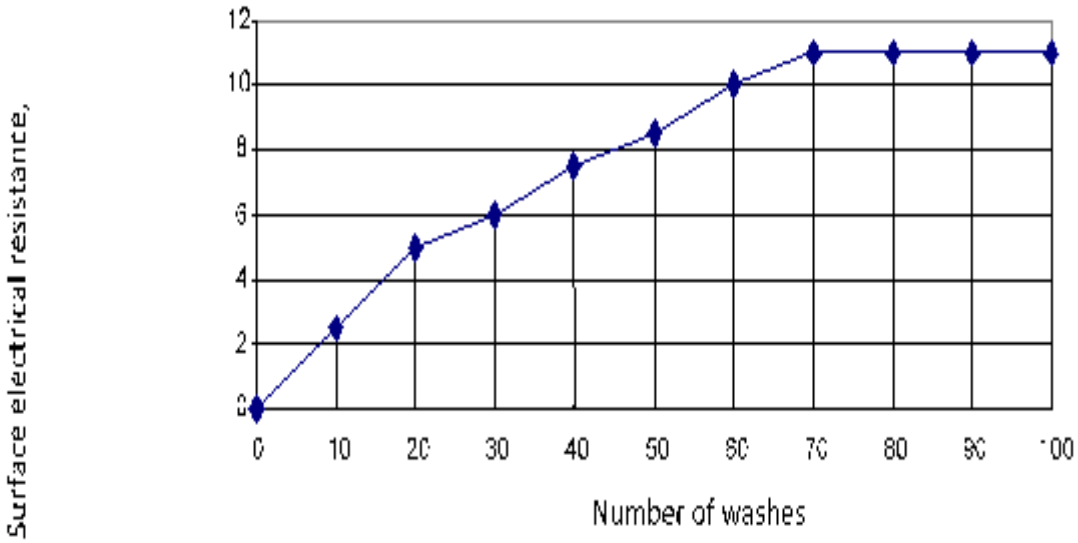


Figure1. The dependence of the electrostatic potential (V) on the number of washes.

The surface density of the fabric is important in the production of different types of products. The surface density of the electrically conductive fabric is 161.2 g / m2.

Hygroscopicity is one of the important properties of fabric. Hygroscopicity is a property that characterizes the ability of a textile fabric to absorb vapor and water from the environment and release it into this environment. Hygroscopicity occurs due to the presence of cotton fiber in the conductive yarn. The hygroscopicity of the conductive fabric is 58%. One of the areas of interest in the study is the study of the electro physical properties of antistatic fabric and its resistance to repeated washing. This indicator is important as it determines the service life and conditions of the antistatic fabric. Depending on the number of washes of the fabric yarns is less prone to friction. The abrasion resistance of the conductive fabric is 18,700 rpm.

Figure 1. The dependence of the electrical resistance of the surface on the number of washes. As, even after 100 washes, the Rds. in the sample did not exceed 10 • 104 Ohms. This in turn indicates that the fabric under study has a sufficiently stable antistatic property. As a result of washing the

sample 40-50 times, the electrostatic potential almost stops changing and its values are in the range of 150-500V and the sample is negatively charged because of washing. For comparison, that the electrostatic potential of a simple (electrically conductive) polyester fabric depends on the number of washes.

The potential of the washed fabric is 175V, but after the first wash, it increases to 3300V and the fabric starts to electrify strongly. This was due to the removal of the antistatic drug from the fiber during the polyester fiber extraction process.

In summary, it was found that the conductivity of the conductive fabric is 29.5 cm3 / cm2 • s, the friction resistance is 18,700 rpm, and the hygroscopicity of the fabric is 58%. It was also found that the Rs of the sample did not exceed 10 • 104 Ohms after 100 washes and that the electrostatic potential of the sample almost stopped changing after 40-50 washes and that its values were in the range of 150-500V and that the sample was negatively charged.

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