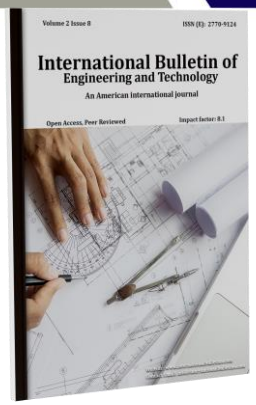


# RESEARCH ON THE RELATIONSHIP BETWEEN THE CHARACTERISTICS OF MIXED FIBER YARN AND ITS FIBER COMPOSITION.

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**Abstract.** In this article, designing and controlling the quality of textile products is a difficult task for scientists in the field of textiles, because the quality of the fiber and the yarn obtained from it is determined by a large number of indicators and depends on various factors. Information and recommendations are given on the mixture coefficient, determination of the average length of the chemical staple fiber, geometrical properties of the fiber, when the percentage of components in the mixture changes for the yarn with different fiber composition.

**Key words:** thread, fiber, chemical fiber, mixture, thread hardness, linear density, modal, staple, average mass length.

The textile industry is the main industry in many countries, including the economically developed countries of the world. It plays a key role in the economy of these countries, because its products are consumer goods that satisfy one of the basic needs of people - the need for clothing. The consumption of textile materials in the world has a steady growth trend, and this growth is due to both the increase in the population and the increase in the volume of textile consumption per capita. In addition, the growth of the consumption of textile materials in the world is significantly ahead of the growth of the population.

The main task of textile industry enterprises is to produce and sell competitive products. The main factors of ensuring the competitiveness of products in market conditions are as follows: reducing its cost, increasing product quality, improving consumer characteristics of products, creating a wide and mobile assortment.

The quality of the obtained thread is provided by the characteristics and composition of the raw materials, which play an important role. It is important to choose the optimal composition of raw materials to obtain the desired quality and target yarn. The calculation of the weight average indicators of fiber mixtures - linear density, breaking strength, relative breaking strength is carried out by taking into account the percentage share of each component in numbers by the number of fibers in the mixture.

Calculation of modal, staple, average mass length, uniformity, ratio of short fibers is obtained from the weighted average series of fiber distribution along the length, taking into account the percentage contribution of each component by the number of fibers.

Table 1
Fiber composition of the components being mixed

| Mixed group | Fiber type | Fiber content of the mixture,% | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Cotton polyester | Cotton | 90 | 80 | 70 | 50 | 40 | 20 | 10 |
| | Polyester | 10 | 20 | 30 | 50 | 60 | 80 | 90 |

Analyzing the obtained data, we can conclude about the weighted average linear density of fibers with a decrease in the content of cotton fiber from 90% to 10% and an increase of polyester fiber from 10% to 90%. The mixture does not change, because the linear density of the initial components is the same. Since the strength of polyester fiber is lower than that of cotton fiber, the breaking strength is slightly reduced by 1.5-2.1%. The relative breaking load decreases by 1-2.5%, the length of the staple mass increases by 3.4-7.2%, the coefficient of change in length decreases by 0.9-28.8%.

The range of yarn and fabrics made from it should be expanded by increasing the use of chemical fibers mixed with cotton, according to the general development trend. Using new types of natural and chemical raw materials, it is planned to increase the production of cotton and mixed fabrics for overalls, knitted underwear, assortment of children's and socks, multi-component yarns of new constructions, as well as technical fabrics. All types of natural and chemical fibers have their own characteristics, and by mixing them in a certain ratio, high-quality finished products with new consumer properties can be obtained. Different compositions can be used to produce yarns of different linear densities and purposes. The feasibility of mixing cotton with different chemical fibers is to create predictable consumption properties, optimal production of mixed yarn and products from it. The effect of individual components is important in the production of woven and knitted products with specific physical and mechanical properties, each of which introduces its own characteristics to the yarn. This opens up great opportunities for expanding the range of fabrics and knitted products and enriching them with new performance features

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