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THE ROLE OF PHYSICS FOR LIGHT AND AGRICULTURAL INDUSTRY SPECIALTIES

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Abstract:

In the article, depending on the density of the fabric material, the final product obtained from fabrics, complex concepts are considered that can be divided into thermal properties of fabrics-thermal conductivity, heat resistance, fire resistance and others. One of the main products of the textile industry is a fabric designed to meet the needs of the population, and training, demonstrating by experience that it is used as raw materials and auxiliary materials in the clothing, footwear, food industry, mechanical engineering and other industries, gives the student a solid knowledge and understanding.even in further work, the user develops skills to work with the thermal properties of fabrics

Keywords: Textile, clothing, footwear, food industry, mechanical engineering, thermal conductivity

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Among the reforms carried out in the socio-economic sphere of Uzbekistan, great importance is attached to the sphere of science and education. In particular, the resolutions PP-2909 "On measures for further development of the higher education system" signed by the President of the Republic of Uzbekistan Sh.M. Mirziyoyev on April 20, 2017 and PP-5032 "On measures to improve the quality of education in the field of physics and the development of scientific research" on March 19, 2021 raised the reforms carried out in the field of science and education, to a new level. In special programs aimed at ensuring the implementation of the above-mentioned resolutions, a number of urgent tasks were identified aimed at developing the material and technical base of higher educational institutions of the Republic, improving the quality of education, providing educational, methodological, pedagogical personnel, improving the quality of teaching physical sciences, introducing modern teaching methods. In this context, the improvement of educational and regulatory documents, curricula and programs, the development and implementation of practical measures to comprehensively support fundamental scientific research in the field of physics, improving the efficiency of the system of training scientists and deepening the integration of "Science - education - production – territory" are urgent issues today.

To date, the physics course is practically not differentiated taking into account the direction of training of students of the specialty "Technologies and design of light industry products" (T and KILP), (a similar situation is observed for other specialties). The same attention is paid by physics teachers to all sections of the course. However, as practice shows, students of the specialty T and KILP of different directions need a different base for mastering professional disciplines, therefore, the physics course should differ in qualitative and quantitative composition. For the specialty "Technology and design of light industry products" (T and KILP), the physics course is the basic one for mastering professional disciplines. Thus, the physics course is the basis of such courses as "Metrology, standardization and certification of light industry products", "Qualimetry", "Theoretical and applied Mechanics", "Machine Parts", "Theory of machines and mechanisms", "Electrical Engineering and electrical equipment", "Electric drive", "Electrical Engineering", "Heat Engineering", "Ventilation and air conditioning", "Pneumatic transport", "Materials science of light industry products", "Technological equipment of light industry".

This article discusses the specialty of T and KILP, on the example of which it is possible to reveal the role and importance of physics for light industry. Light industry is a combination of various industries that produce mass–consumption products from certain types of raw materials. This type of industry is directly related to the economy of any country, since the indicators of gross domestic product largely depend on the development of light industries. In addition, the scope of tasks of light industry includes not only the production of finished products, but also the primary processing of raw materials. The products that are produced by light industry enterprises are widely used in all kinds of different branches of human activity. One of the main products of this industry are fabrics that meet the

needs of the population and are used as raw materials and auxiliary materials in the clothing, footwear, food industries, mechanical engineering and other industries [1, 2].

The textile industry is a branch of light industry engaged in the processing of plant, animal, artificial and synthetic fibers into threads, fabrics, yarn. The textile industry includes cotton, silk, wool, knitting, linen, as well as primary processing of raw cotton, wool, net knitting industry, production of nonwovens and others [3]. Various textile threads are used to make fabrics. A textile thread is a flexible and durable body of considerable length with small transverse dimensions used for the manufacture of textile products.

By their nature, fibers and fabrics have a variety of physical properties – gyroscopic, optical, electrical, etc. – that must be taken into account in production [1, 4]. Professionally significant concepts for T and KILP specialists lie in the field of physical knowledge, which can be divided into the main sections of classical physics, studied as a basic course in Bukhara engineering and technological Institute:

1. In the mechanics section, the fundamental concepts for the textile industry are the concepts of density, deformation and friction. Depending on the density of the fabric material, the final product obtained from these fabrics differs. Fabrics with a low surface density are used for underwear, with a higher one – for suits, and with the highest one – for coats. Compression and stretching as one of the main types of deformation are significant in shaping shoes, as well as outerwear. The friction of materials manifests itself at high speed modes of operation of sewing machines – at high speeds, the needle gets very hot and can bend, while also spoiling the fabric [5].
2. In the section "molecular physics", the main concepts for the textile industry are the wettability of fibers and fabrics, capillarity, adsorption and absorption phenomena. One example of the manifestation of the physical quantities described above is the ability of a textile material to be wetted with polymer glue. The phenomenon of capillarity characterizes the gyroscopic properties of clothing materials. Adsorption materials created on the principles of the phenomenon of adsorption have found their application in the manufacture of protective clothing, which is provided with a reinforcing layer made of fibers or threads. Adsorption is manifested in the process of absorption of water vapor by the entire volume of fibers.
3. The subsection "electromagnetism" studies such phenomena as electrification, electrical strength, permittivity, which are important in the textile industry. As a result of the redistribution of charges during friction, positive or negative charges may occur on the tissues, causing electrification phenomena. The dielectric permittivity of tissues, which determines electrical losses, depends more on the structure of the fibers of the tissue.
4. The basic physical concepts for the textile industry, which are considered in the optics section, are physical quantities that determine such properties of the fabric as color, gloss, transparency and whiteness. The colors of certain fabrics depend on the ability of the fabric to absorb and reflect electromagnetic waves, which are visible light. To increase the gloss in the manufacture of fabric material, fibers and threads with a smooth, even surface are used. The transparency of the fabric is determined both by the transparency of the fibers themselves and by the density of their location in the structure of the material. The whiteness of textile materials is characterized by a brightness coefficient r, measured at a wavelength of 540 nm.

Other fundamental physical principles in the production of fabrics are the gyroscopic and thermal properties of various materials.

Gyroscopic properties are described as characteristics of humidity or moisture content of tissues. Humidity is the percentage ratio of the mass of water removed at a certain temperature to the mass of dry material. Depending on the specific stages of production, the actual, equilibrium and maximum humidity are taken into account. The actual humidity is the humidity that the fibers or threads have at the time of measuring the initial mass. Normal humidity is the humidity that fibers or threads acquire after exposure to normal atmospheric conditions. The maximum humidity is the humidity measured after exposure to a relative humidity of 95-100% and an air temperature of 20 °C. Moisture content is the percentage ratio of the amount of water in the material to the mass of the non–dried material [5].

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