



Structural Properties of Natural Tissue and their Classification

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ABSTRACT

The article describes the production and application of fabrics from natural fibers, their use in terms of composition and properties, as well as the positive and negative effects of fabrics from natural fibers on the human body and their variability depending on the weather.

Keywords:

clothing, natural fabric, cotton fabric, silk fabric, linen fabric, woolen fabric, cashmere fabric, leather fabric, ramie fabric, hemp fabric, jute fabric, textile, chiffon, hygroscopic properties of fabric.

Introduction

In the system of clothing quality indicators, hygienic indicators are of paramount importance, which determine the microclimate near the surface of the human body, its heat and gas exchange with the environment. The optimal microclimate under clothing ensures the normal functional state of a person, his well-being and, as a result, maintaining high working capacity, increasing labor productivity, and the efficiency of human life as a whole. This explains the fact that the importance of hygienic indicators of consumer appraisal of clothing is constantly increasing and is becoming an increasingly important criterion for the purchase and consumption by the population of both ready-made clothing and materials for it. This also explains the significant increased attention in recent years, both in scientific research and in the practice of creating clothes, to the problem of the adequacy of clothes to the conditions of its operation in the system man - clothes - environment.

Today, when buying a finished product or material for tailoring, one should always pay attention to the properties and quality of the fabric. Many natural sources of cellulose are

used to make textiles. A variety of fiber-rich plants and animals are grown to meet the demand for textiles. Natural materials mixed with regenerated polymers are a new direction in the textile industry due to the unique properties of composite products and the presence of natural fibers. For many centuries before that, there were a priori judgments in this area, while giving decisive importance to the raw materials: wool, cotton, silk, attributing to them a beneficial effect on human health. If earlier great importance was attached to the source material such as hide (wool, cotton, etc.), then later a scientific position was formulated that the hygienic characteristic of the clothing material as a whole is determined to a greater extent by the structure of the fabric. Textile fabrics made and sold from natural fibers are classified according to the source of the fiber.

Cotton fabric is a natural fiber made from cotton seeds that is used to make a variety of fabrics. Cotton fabric is the most soothing and safe fabric. The widespread use of cotton fabric for children's clothing or bedding is evidenced by its softness and suitability for the skin. The peculiarity of cotton fabric is that it easily adapts to climatic conditions, so cotton fabric is also

called all-weather-type fabric. In summer, cotton keeps the body cool and easily absorbs sweat, while in winter it creates a feeling of warmth. Cotton fabric is used to make cambric, gabardine, poplin, velvet and other similar fabrics. It is known that from cotton it is possible to make the thinnest fabric such as cambric and air-resistant tent fabric and very loose knitted fabrics.

Silk fabric is the most durable natural fabric in the world. Known for its softness, sheen, beauty and luxurious feel, silk fabric is one of the best fabrics for comfort in any weather. In 2640 BC, silk was found in China that kept cool in summer and warm in winter. There are various silk fabrics on the market, such as chiffon, georgette, damask, taffeta, organza, crepe de chine, shantung, dupion and others. Silk fabric today is mainly used for sewing luxurious and expensive clothes and interior items. Indian silk fabrics are known all over the world. For instance, Italy and Uzbekistan are now among the largest producers of high-quality silk fabrics.

Linen fabric. It is no exaggeration to say that linen is the king of natural fabrics. Flax is widely used in the production of outerwear and underwear. Linen fabric is a natural fiber and is safe for all skin types. Linen fabric is also recommended for sensitive skin due to its resistance to allergens. Linen fabric does not cause irritation, allergic reactions and similar side effects. Linen is a fabric that is easy to care for and does not require special washing methods and it can be easily cleaned by hand. Although linen is used to make all kinds of clothing, it is mainly used to make tablecloths, sheets, linings, curtains, and other similar household items.

Wool is a soft and durable fabric that gives clothes a warm and inviting look. Woolen is a fabric that keeps clothes dry when it's sweaty and cool when it's hot. Wool, which has been used in clothing for over 12,000 years, comes not only from sheep, but also from goats. Woolen fabric has many properties, such as heat resistance, wear resistance, lightness and strength, moisture resistance. It is mainly used to make blankets and rugs, and today we can see that almost every wardrobe has woolen clothing.

Kashmir (Cashmere Fabric). Cashmere fabrics are made from the wool fibers that make up the underside of the cashmere goat. The term "cashmere fabric" is often used to refer to very soft wool. Kashmir goat wool is often considered a special or luxurious fiber due to its high cost, softness, luster and rarity.

Leather fabric. The fabric is soft and durable, comfortable in both hot and cold weather. Leather fabric has the ability to absorb water vapor without losing its dryness and retaining its original shape when stretched.

Ramie Fabric which is made from the ramie plant, which is also called Chinese grass. Because it is grown in China as a fiber crop. Ramie is one of the strongest natural fibers and gets stronger when exposed to wet. Ramie fibers are particularly renowned for their ability to hold their shape, reduce wrinkles and impart a silky sheen to fabrics. In the textile industry, moisture-absorbing, breathable ramie is valued as a summer fabric that is not damaged by weak acids and resistant to alkalis. Ramie was used to make open knit fabrics called mekhera which are suitable for hot climates.

Hemp Fabric - Versatile hemp fabric is used to make a wide range of products such as shoes, furniture, clothing, accessories and household items. Hemp fabric is known for its warmth, softness and durability. Due to its beautiful sheen, hemp fabric is suitable for making clothes that can withstand harsh conditions and last longer. With properties such as wear resistance, absorbency, thermal insulation, the fabric is more resistant to water than other textiles. It is obtained from the stem of the plant. Today, the best hemp fabrics are made in Italy. Hemp fabric is widely used in clothing, curtains, upholstery, bed sheets, kitchen towels and home decor.

Jute fabric. Jute fabric, one of the strongest and most durable fabrics, has been ideally used as a bag or packing bag since ancient times. Jute fabric is a popular material for sewing fashionable clothes, interior items and fashion accessories. Bangladesh is the largest producer of jute fabrics and India is the second largest producer of jute products.

Clothing production is one of the important sectors of the national economy, however, the

scientific development of clothing design issues, as well as methods for its evaluation, lags behind consumer requirements. Important indicators of the hygienic requirements of fabrics for dresses are their breathability, hygroscopicity, moisture absorption and moisture return.

Below are the indicators of hygroscopicity of some materials:

Textile	Moisture conductivity, g/(m ² *h)	Water absorption, %
Cotton	98 – 110	58 – 120
Made from natural silk	90 – 100	65 – 75
linen	105 – 110	68 – 106
Woolen	90 – 100	70 – 94
half-woolen	66 – 88	62 – 75

The hygroscopicity of fabrics used for the manufacture of summer dresses must be at least 7%. The best hygroscopic properties are fabrics made from natural fibers, especially linen, wool and cotton. Fabrics for summer dresses should have low density and small thickness, have increased resistance to light weather and washing solutions. Hygienic requirements for fabrics for formal dresses intended for short-term wear are less significant, but their non-compliance should, if possible, be compensated by the design of the product.

Based on the foregoing, it can be concluded that textile fabrics made from natural fibers, such as cotton, silk, linen, cashmere, leather, ramie, hemp, jute, can be used for various purposes depending on their compositional properties. Therefore, all the main properties of clothing fabrics: weight, thickness, breathability, thermal insulation can vary over a wide range depending on the method and technology of their preparation depending on the thickness and degree of twisting of the threads, the nature of their weave, the density of the fabric, etc. This situation is explained by the fact that textile materials are not a homogeneous material and can be a diverse and complex structure consisting of the original material and air.

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