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Theoretical Bases of Using Textile Materials in the Industry

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ABSTRACT: This article presents the technical requirements for textile materials as well as the definition of their purpose, the technology for manufacturing products from them and the operating conditions. The use of textile materials for filtering industrial fluids and purifying aspiration air in vacuum, belt, bag and other filters. The use of textile materials for packaging technical products, wiping and polishing various products.

KEYWORDS: textile materials, clothing manufacture, reinforcement, knitwear, technical products, sound-absorbing and cushioning materials, polymer and mineral fibers, linen and half-linen canvas made from linen, cotton and polyester yarn.

I. INTRODUCTION

Textile materials have long been used in the production of clothing, linen and other consumer goods, which each of us is well aware of from our own experience. Less well-known is the use of textile materials for industrial purposes, despite the fact that it is large and diverse. The production of technical textile materials is increasing every 10 years by 50%, so in this section we focus on textile materials designed to meet the needs of industry.

Textiles are widely used for the upholstery of vehicles and furniture, in the manufacture of tent materials for automobiles and in the construction of easily assembled inflatable structures, the manufacture of automobile airbags, sports equipment, the manufacture of tire cord, the reinforcement of conveyor belts, artificial leather [1].

In recent years, the use of geotextile non-woven materials to strengthen the soil during the construction of roads, in agriculture and horticulture, in the construction of hydraulic structures, the construction of underground utilities and for other purposes has gained great development.

II. SIGNIFICANCE OF THE SYSTEM

A significant amount of textile materials from polymer and mineral fibers is used in the production of reinforced plastics.

Textile materials are used to filter technical fluids and purify aspiration air in vacuum, belt, bag and other filters.

Textile materials are also used for packaging technical products, wiping and polishing various products.

One of the largest consumers of textile materials is the automotive industry. On her example, it is convenient to consider the main areas of application of these materials and the technical requirements for them.

III. LITERATURE SURVEY

The mass of textile materials in one middle-class car is 60 kg, or 5% of the mass of the car. This includes fabrics, knitwear and carpets used for seat upholstery and car interior trim, airbags and seat belts, noise absorbing and cushioning materials, tire cord, filters, etc. [2].

Technical requirements for textile materials are determined by their purpose, technology of manufacturing products from them and operating conditions.

So, for example, the fabric for the manufacture of airbags should be light, gas-tight, heat-resistant, durable, resistant to shock loads of rapidly expanding gas when the safety system of the driver and passengers is triggered as a result of an emergency.



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Other requirements are presented to tent material. It must be durable when exposed to tensile loads, resistant to ultraviolet radiation and oxygen, waterproof, heat and frost resistant, easy to clean from dirt and dust. This material must be susceptible to welding in an alternating electric field of high frequency (or other high-performance method) with the formation of strong and tight welds. And finally, tent material should be non-combustible [3].

IV. METHODOLOGY

Synthetic awning materials of a multilayer structure meet these requirements to the greatest extent. The inner layer is usually made of fabric or non-woven fabric made of polyester or polyamide fibers. Outside, a polyvinyl chloride-based polymer coating is applied to the textile base. Synthetic awning materials have high tensile and tearing properties, are fireproof, oil and gas resistant, are operable in a wide temperature range (some types of materials have frost resistance up to -60°C). Such materials are easily welded in a high-frequency electric field, hot air and other methods. They can have any color scheme, as well as be translucent. Thanks to a specially selected stabilizing group, the polyvinyl chloride coating of synthetic tent materials is resistant to light and heat for a long time.

Along with synthetic awning materials, linen and half-linen canvas are produced from linen, cotton and polyester yarn. Such materials have water-resistant impregnation, but their water resistance is small compared to synthetic tent materials having a film coating. Canvas awnings cannot be welded, but are made by tailoring. Their longevity is limited to 1-2 years. The advantages of canvas are low surface density and high hygienic properties: it is breathable.

A number of general requirements are imposed on textile upholstery materials: high decorative and artistic properties, non-flammability, abrasion resistance, drape. Along with the need to meet these requirements, textile materials should be easily cleaned of contaminants by wet cleaning, should not have high shrinkage, be electrified and pilling.

An important property of upholstery is resistance to light aging, since the main destruction of both the materials themselves and the dyes occurs precisely under the influence of sunlight. The degree of destruction, which consists in changing the color of the material and its strength properties, depends on the type of dyes used, the presence of stabilizers and the nature of the fiber-forming polymer.

V. EXPERIMENTAL RESULTS

The most light-resistant fabrics made from natural wool. Synthetic fabrics react differently to the effects of ultraviolet rays: polyamide-based materials do not withstand them well, but better with polyester fabrics and knitwear. High light fastness is possessed by polyacrylonitrile-based textile materials.

One of the important requirements for textile materials is resistance to microorganisms - biostability.

Protection of textile materials from biological aging is achieved:

- the introduction of antiseptic drugs in spinning solutions or melts when forming fibers;
- grafting monomers or polymers with antiseptic properties to the fibers;
- impregnation of textile materials with fungicides.

As a rule, mushroom resistance to textile materials is imparted by impregnation with solutions, emulsions and suspensions of fungicides. For these purposes, a salicylanilide solution with a concentration of 2.5 g/l , a solution of copper 8-hydroxyquinolate with a concentration of 20 g/l and other antiseptics are used.

Upholstery textile materials - fabrics and knitwear - are made from yarn based on mixtures of natural and synthetic fibers. This provides them with a sufficiently high hygiene (hygroscopicity and breathability) and physico-mechanical properties. Such fabrics are resistant to abrasion, have high strength, are easily cleaned from dirt, etc.

The most expensive cars use high-pile upholstery wool and semi-woolen fabrics (plush, velvet). One of the upholstery materials not only in the automotive industry, but also in the manufacture of other vehicles (wagons, trolleybuses, trams, airplanes), as well as furniture, is artificial leather. Such materials are a textile base with a polymer (polyurethane or polyvinyl chloride) coating.

The textile basis - fabric, knitwear or non-woven fabric - is made of polyester, polyamide, cotton and viscose fibers. The polymer coating may have a monolithic or porous structure.

Upholstery artificial leathers have high strength properties, drapability, abrasion resistance, resistant to soap solutions, gasoline and oil, non-flammable. These properties are achieved by creating special polymer compositions for film coating and by impregnating a textile base.

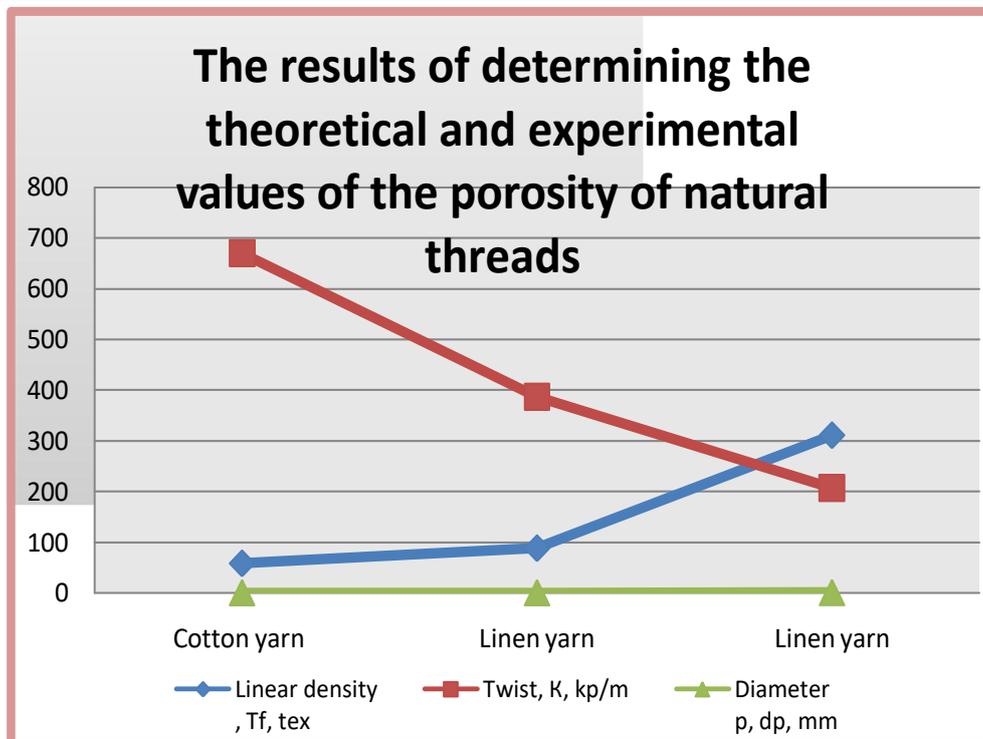
Excellent aesthetic properties, despite low hygiene indicators, allow the use of artificial leather for upholstery even of expensive cars and furniture.

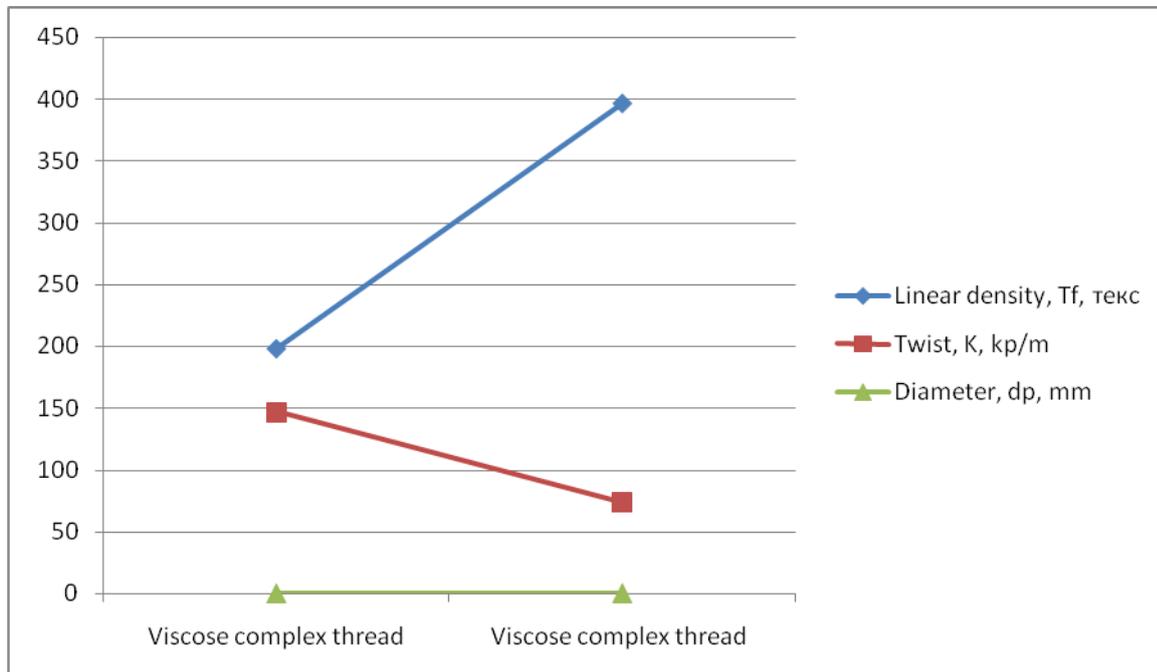
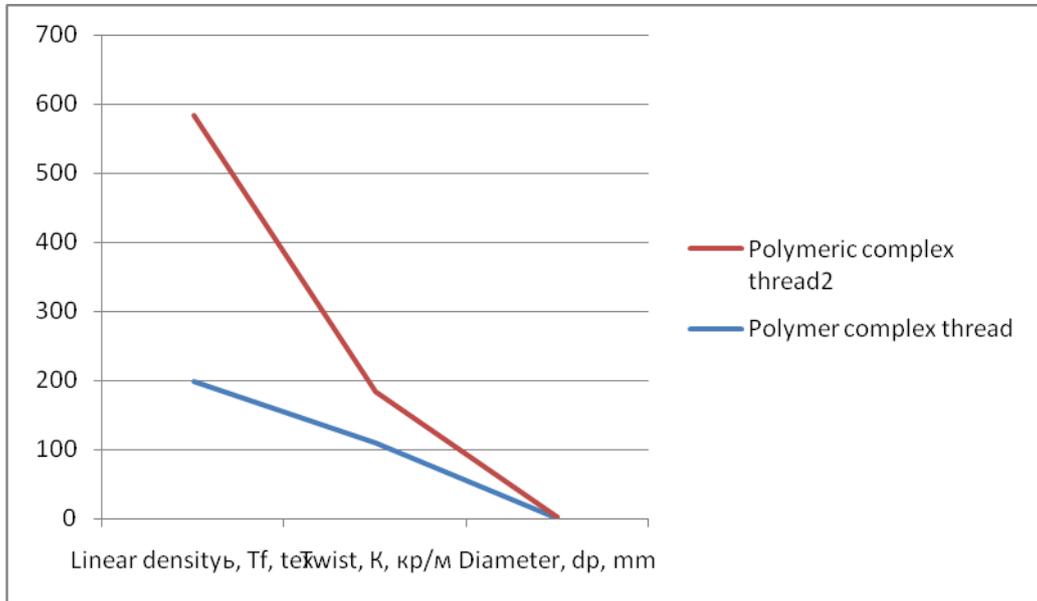
Widely used for the manufacture of floor coverings in vehicles, office premises and at home carpet textile materials. They reduce the noise level in the vehicle and the room, have good thermal insulation properties, satisfy modern aesthetic requirements.

Table 1.

The results of determining the theoretical and experimental values of the porosity of textile yarns

Linear density, T_f, teks	Twist, $K, \text{kp/m}$	Diameter, d_p, mm	Porosity, %	
			Theoretical (model), P_u	Experimental P_k
Ring Spin Cotton Yarn				
58	670	0,346	39,66	38,09
Ring spinning linen yarn				
88	387	0,389	52,87	50,89
311	207	0,685	53,28	50,01
Polymer complex thread				
198	109	0,785	60,01	57,15
386	74	1,11	56,85	56,59
Viscose complex thread				
198	147	0,598	64,87	61,51
396	74	0,757	60,21	57,37





The flooring in the vehicle works in harsh conditions. It is subject to significant abrasive wear, exposure to light, aggressive environments, water, mold. The coating should retain its properties in a wide temperature range, have good heat-shielding properties and low weight, be non-flammable. From the point of view of manufacturability, the material should be easily molded, have adhesion to coating and impregnating polymer compositions. To ensure these properties in the manufacture of carpets, the characteristics of polymer raw materials, the features of the manufacturing method, the influence of the structure of the material, the height of the pile and other factors are taken into account.



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REFERENCES

1. Treschalin Yu.M. The rationale for the use of non-woven fabrics for the production of composite materials on a textile basis. year 2013.
2. Romanenkov V.A. Development of technological means for the production of heat-protective coatings for spacecraft with improved characteristics. 2019 year.
3. Borozdin S.V. Development of a technology for producing flax-containing material for the production of insulated insoles of shoes with improved hygiene 2006.
4. Zhilina, Elena Vladimirovna Scientific principles of the technology of composite textile materials and garments based on acrylic copolymers. 2005, Knyazkin Stanislav Valerievich "Development of technology for creating textile reinforcing components of composite materials used in the nuclear industry". 2016 year.