



CHANGES IN THE STRUCTURE OF KNITTED FABRICS

Nizamova B.B.

Assistant, Department of Light Industry Technologies and Equipment, Fergana
Polytechnic Institute, Fergana, Uzbekistan

E-mail: barno.nizamova.89@bk.ru

Abstract

This article presents the results of the analysis of the physical and mechanical and technological performance of 3 variant samples of knitted mixed knitted fabric obtained based on PAN yarn with a new structure, high shape retention properties, effective use of local raw materials and recommendation to the product range.

Keywords: pattern, needlework, light industry, cotton fibre, friction, technology, toughness, heat storage.

Introduction

Today, scientists and specialists working in the knitting industry have the task of developing resource-saving technologies in the production of new knitted fabrics, expanding the technological capabilities of knitting machines and efficient use of local raw materials. This, in turn, will reduce the cost of production and expand the possibility of processing local raw materials in the production of finished products. In the direction of socio-economic development of the country, it is necessary to develop and implement a set of measures to reduce the cost of production, save raw materials, creating competitive products that meet the requirements of GOST (state standard) and international standards. Rich assortment and high quality of products, the introduction of resource-saving computer technologies, fast execution of orders are able to meet the needs of the most demanding customers.

Materials and Methods

Today, the effective use of local raw materials requires the production of new structures of beautiful, affordable, high-quality knitted fabrics, which require the expansion of the range of competitive products with good physical and mechanical properties, hygienic and aesthetically high quality. is coming [1-4].

To provide competitive products that meet the needs of domestic and foreign markets using new techniques and technologies, raw material-saving methods are widely used in the production of various types of knitted textiles. Samples of double-layered knitted fabrics with high shape and heat retention properties, recommended for outerwear, were obtained under the same technical conditions in accordance with the requirements of GOST, the PAN yarn used differs in the amount and placement of yarns in the knitted fabric [5-9].



a)

b)

Figure 1. Knitted fabric

Change in elongation of knitted fabric before breaking
 histogram irreversible deformation en (%) change

All GOSTs and TSs used for knitted fabrics include normative parameters on elongation and tensile strength. Breaking force is the force required to break a specimen at a given size and speed. The braking force is expressed in Newtonian units [10-17]. The tensile strength of the tested knitted samples was determined using the standard method YG-026T dynamometer. Tissue toughness, ie analysis of tensile strength, shows that the strongest fabric in height is variant 1, which has an index of 269 N, and the lowest index is 2. variant and its index is 226 N. (Table 1, Figure 1). The strength of the tissue in width was also observed in variant 2, the tensile strength of the tissue in width was 184 N, and invariant 3 the lowest tensile strength was observed, which is 127 N [18-24].

Results and Discussion

Fibres made of polyacrylonitrile (PAN) are soft and do not damage the skin, fewer wrinkles, but retain plexuses and wrinkles formed by heat treatment. The fibre has a non-flattening twist and produces less peeling than other synthetic fibres.



Washes well with water and dries quickly, has good heat retention properties. Products made of PAN yarn can be washed many times, without losing their original appearance. Due to the presence of all these properties, PAN yarn can be used in the textile industry in the production of knitwear, in the production of woollen fabrics in combination with other fibres (wool, viscose, cotton fibre).

The composition of the elements in the row of rings and their amount affect the length of the yarn in the row of rings, and thus the elongation of the knitwear. The elongation of a knitted fabric is defined as its elongation under the action of a force. Elongation is characterized by the elongation of the test specimen. Elongation is expressed in absolute or relative units. When testing YG-026T knitted fabrics with a length of 100 mm clamped to the dynamometer, their absolute and relative sizes are the same. The lower elasticity of the fabric will be the higher the shape-retaining properties of the knitwear. In conclusion, the amount of elongation of the knitwear in terms of height and width depends on the structure of the knitted fabric and the type of yarn in it, meets the requirements of GOST 28554 and is recommended for the range of outerwear. When designing products, it is important to know what elastic properties knitted fabrics have [3]. Deformation of knitwear varies with the elasticity, stiffness and number of loops of yarn. Not only the description of the deformation but also the state of knitting is determined by the internal, two main forces: the elastic force of the yarn bending to the ring tends to straighten and change the shape of the yarn. As a result, there is a frictional force between the threads, which prevents the placement of the threads in the loop and interferes with the structure of the knitted fabric [4,5].

Knitted fabrics have a significantly higher elongation than woven fabrics and have a highly elastic structure, even under small stresses. The principle of operation of machines for the decoration of knitted fabrics is almost no different from the machines for the decoration of woven fabrics. It was noted that one of the main reasons for the high level of penetration is the excessive deformation of knitted fabrics in finishing operations.

Conclusion

In short, the amount of elongation of the knitwear in terms of height and width depends on the structure of the knitted fabric and the type of yarn in it and meets the requirements of GOST 28554.



Can be recommended for the range of outerwear. Due to the effect on the structure of the knitted fabric obtained on the basis of the rows of rings, its thickness, heat and shape-retaining properties increased.

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