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Quality Indication of Silk Yarn Products for Silk Carpets

**KHAYDAROV SANAT SUNNATOVICH, ISLAMBEKOVA NIGORA MURTOZAYVNA,
JOLDASOVA AYZADA BEKBAULIEVNA, MUXIDDINOV NURIDDIN MUXIDDIN O'G'L**

Tashkent Institute of Textile and Light Industry (Uzbekistan)

Tashkent Institute of Textile and Light Industry (Uzbekistan)

Karakalpak State Named After Berdak University

Tashkent Institute of Textile and Light Industry (Uzbekistan)

ABSTRACT: This paper presents the quality indicators of high linear density spun silk yarns, the body yarn is twisted in the direction of 350 b/m S, the back yarn is twisted in the direction of 250 b/m Z, and the effect of these twists on the tensile strength of the yarn is elongated. The body strip is 210 tex and has a tensile strength of 5870.91 cN. The total elongation is 13.16%. The arc strip is 1843.63 cN. Based on the results of 11.07 % of the total elongation, it has been proved that these silk threads can be used as raw materials for carpet products.

KEY WORDS: Silk, yarn, carpet, backing, spun, quality, indicator, text, direction.

I. INTRODUCTION

We are well aware that the technology of preparation of raw materials for carpet products, which today has its place in the world textile industry, consists of complex technological processes. But now the demand for carpet products has increased dramatically and the manufactured carpet products will need quality raw materials. In addition to hand-woven carpets by artisans, the raw materials for machine-made carpet products must be of good quality. Resolution of the President of the Republic of Uzbekistan "On measures to develop the field of hand-woven carpets in the Republic" No PP-4759 dated 26.06.2020. According to the decision, the Uzbekpaksanoat Association will hold an international festival of hand-made Oriental Carpets in Tashkent every two years from 2021 in October. The development of hand-woven carpets in the country involves the involvement of qualified specialists and the widespread introduction of innovative technologies, attracting the unemployed, especially young people, women and low-income families to carpet weaving, training and retraining, carpet weaving skills, small workshops and to assist in providing employment through the organization of carpet weaving in households, to take measures to provide artisans and organizations with the necessary amount of raw materials and equipment for weaving carpets of silk, silk waste, wool and cotton in the regions, to create a value chain assistance in establishing cooperation between processing organizations, livestock farms and carpet weavers, organization of seminars, conferences, fairs and exhibitions on carpet weaving, as well as local carpet weaving organizations and crafts It is planned to provide practical assistance to NGOs in participating in fairs and exhibitions abroad, and to ensure the implementation of this decision will need not only qualified specialists, but also quality raw materials [1, 2, 3].

II. ANALYSIS OF EXISTING FILTERING MATERIALS AND RESEARCH RESULTS

In order to achieve these goals, which are aimed at the introduction of international quality standards in silk carpet products and the export of hand-woven carpet products, first of all, high-quality high-density silk yarns are needed and research has been conducted to create technology for their production.

Raw silk yarns cannot be used for carpet products. Therefore, it is necessary to grow (bake) raw silk. Spun yarns are distinguished by the following characteristics: the type of primary yarn, the degree of spinning, the direction of spinning, the structure of the spun yarn, the tension state and size of the yarn, the function of the yarn, what purpose it serves.

According to the type of primary yarns, spun yarns are divided into natural yarns (silk raw materials, cotton yarns, wool yarns, etc.), artificial (viscose, acetate, copper-ammonia), synthetic (polyamide, polyester, polypropylene, etc.), glass yarns, as well as complex yarns composed of different primary yarns combined. According to the degree of

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growth, ie according to the number of yarns per unit length, spun yarns are divided into three groups: low-spun (up to 230 br / m), medium-spun (230-900 br / m), high-spun (from 900 br / m and more) more.

Depending on the direction of growth, the twisted yarns are divided into two: Z yarns twisted to the right and S yarns twisted to the left. The right-hand twists are bottom-up, the right-hand twists Z, the left-hand twists S-bottom-up.

The structure of spun yarns can be simple and complex. In simple structured yarns, the yarn wraps have one direction and are produced in one step. Complex-structured yarns are obtained from several yarns. In this case, the growth gives a certain direction to each thread, then the threads are combined and re-spun, often spun in the opposite direction. Intricately structured yarns have the ability to weave in the form of simple sewing threads and shaped eponj, spirals, and so on. Shaped yarns are mainly produced on special spinning machines, on which knot-shaped, spiral and twisted interwoven yarns are delivered at a higher speed than stem, core yarns. Spun, baked yarns can have simple or high elongation properties and large volume. Yarns with an excess volume of the norm are called textured yarns. Such yarns are made from synthetic (polyamide and polyester) yarns using a special technology that uses heat treatment, respectively, by the process of spinning (baking) [2,3].

III. CONCLUSION AND FUTURE WORK

The range of yarns made from raw silk and chemical yarn varies. The main types of silk products are: backing, tanda, grenadine, muslin, crepe-thin fabric, moskrep, crepe granite, shaped-patterned yarns, sewing thread, surgical and technical yarns, insulating yarns, textured yarns, various binding-structural yarns .

Back-silk is made by weaving one or more of raw materials or chemical yarns up to 150 br / m.

The body is made of natural silk, 2-4 and more silk raw materials.

The terms arqa and tanda used here are conditional in nature, because in addition to the structural yarns specified, yarns of any type and structure of any type can be used as arqa and tanda. For the body, each thread in the composition is first twisted to the right (300 to 600 br / m), then these threads are added and twisted to the left (250 to 550 br / m). The body of chemical yarns, as a rule, is made of individual technical yarns from 180 to 220 br / m.

Grenadine is made of natural silk and differs from tanda by its growth from 1000 to 1500 br / m in the first case and from 750 to 1250 br / m in the second case.

Muslin is a type of fabric with raw yarn spun from 800 to 1500 br / m from a single thread or from chemical yarns from 600 to 800 br / m, from kapron yarns from 100 to 1400 br / m.

Crepe is a thin fabric made of natural silk, as well as chemically complex yarns. Crepe yarn made from silk raw material consists of 2-7 individual yarns and has a right and left rise from 2200 to 3200 br / m.

Crepe yarns, which are chemically complex yarns, are produced from 1 or 2 textile yarns, mainly viscose, with a tensile strength of 1500 to 2500 br / m in the right and left directions. In order to strengthen the twists of the crepe yarn, the sukrutina from the yarns are steamed to prevent the formation of tangles.

Crepe yarn is used in the production of fabrics with a grainy effect crepe de chine, crepe georgette, crepe chiffon, etc.

Moskrep is a moskrep made of natural silk made from 3 or 4 crepe yarns, with the addition of 2 or 3 raw silk yarns. The added yarns are stretched at 500 rpm, and the direction of the twists corresponds to the direction of growth of the crepe yarns.

Crepe - granite differs from moskrep by the following feature, that is, the combined crepe-like and twisted yarns are spun in one direction, the amount of growth is about 500 br / m.

Sewing and surgical yarns Yarns made from natural silk are produced in relatively large quantities from complex, raw silk through several growth stages. For example, a sewing thread consisting of 2.33 tex 12 layers of silk raw material is produced in the following way. A 6-ply yarn is obtained by twisting the yarn in a spinning machine (80 to 150 br / m).

Ribbons (shunurs) made of natural silk are also produced by means of several stages of weaving, but it is necessary to add (combine) a large number of raw silk yarns (from 168 to 624 layers) together.

Insulation threads. Insulating yarns made of natural silk are produced by twisting one or more (2,3,4) raw silk (up to 120-150 br / m), then wrapping it in yarn, boiling, dyeing and re-wrapping it on a spool.

Spun cord yarns are made from viscose and kapron yarns. Viscose cord yarns are produced on special machines or centrifugal spinning machines at 80-100 br / m, usually by twisting to the right. These yarns are spun on special twisting machines at 480-550 br / m. As a result, the twists in the cord strands are balanced.

Above we talked about the twists and directions of growth of different yarns. Yarns made for carpet products show good results when they have a medium maturity level [3, 4].

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You will need quality raw materials for quality carpets You will need to develop technology for making quality raw materials.

In our research work, we aimed at exactly the best quality silk yarn.

Production of high linear density silk yarns:

Wrapping raw silk into a standard yarn:

Emulsification of raw silk:

Re-wrapping of raw silk in babins and preparation for spinning (baking):

Add 300-350 b / m twist to raw silk adding and spinning machines:

The following quality indicators were obtained as the spun silk tan yarn was 210 tex.

Table-1

Ducks yarn from woven silk yarn 210 tex.

| Total evaluation | -N- | -X- | -S- | -CV- | -Q(95%) - 95% | -MIN- | -MAX- |
|-------------------|-----|----------------|---------|-------|---------------|----------|----------|
| Elongation (Fmax) | 2 | 13,11 % | 1,27 | 9,71 | 11,70 | 12,21 | 14,01 |
| EAR; 1% Fmax | 2 | 13,16 % | 1,23 | 9,37 | 11,33 | 12,29 | 14,03 |
| Maximum force | 2 | 5870,91 cN | 215,00 | 3,66 | 1976,39 | 5718,8 | 6022,95 |
| Work to break | 2 | 23449,54 cN*cm | 3477,67 | 14,83 | 31968,04 | 20990,45 | 25908,62 |
| Tenacity | 2 | 32,68 cN/tex | 1,02 | 3,66 | 9,41 | 27,23 | 28,68 |
| Count | 1 | 210,00 tex | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| Time to Rupture | 10 | 7,90 sec | 0,74 | 9,37 | 6,80 | 7,37 | 8,42 |

The following quality indicators were obtained as 216 tex of spun silk back yarn.

Table-2

Back yarn from spun silk thread 216 tex.

| Total evaluation | -N- | -X- | -S- | -CV- | -Q(95%) - 95% | -MIN- | -MAX- |
|-------------------|-----|---------------|---------|--------|---------------|---------|----------|
| Elongation (Fmax) | 2 | 10,91 % | 9,46 | 86,73 | 86,97 | 4,22 | 17,60 |
| EAR; 1% Fmax | 2 | 11,07 % | 9,21 | 83,20 | 84,64 | 4,56 | 17,58 |
| Maximum force | 2 | 1843,63 cN | 340,16 | 18,45 | 3126,90 | 1603,10 | 2084,16 |
| Work to break | 2 | 8109,57 cN*cm | 8797,99 | 108,49 | 80874,52 | 1888,46 | 14330,69 |
| Tenacity | 2 | 8,54 cN/tex | 1,57 | 18,45 | 14,48 | 7,42 | 9,65 |
| Count | 1 | 216,00 tex | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| Time to Rupture | 10 | 6,64 sec | 5,52 | 83,20 | 50,79 | 2,73 | 10,55 |

Conclusion: The physical and mechanical properties of the experimental samples were determined at the CENTEXUZ Testing and Certification Center under the Tashkent Institute of Textile and Light Industry, with an accuracy of 95%.

The main quality indicators of the samples are tensile strength, elongation before breaking, and another important indicator is that the friction resistance of yarns is equal to 40 thousand and 60 thousand cycles.

This spun silk yarn was recommended as a raw material for carpet products. Currently, silk carpets are being woven by artisans.

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