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Study of the Resistance of Natural Silk Body Yarns to Multi-Period Deformation

B. V. Davronov [1]

Annotation: The scientific significance of the results of the research is explained by the development of advanced technology for the production of crepe de chine fabrics from natural silk.

Keywords: Natural silk, cotton, yarn shortening, air permeability, thickness, density, fabric, shoda, tex, twist, steaming, blade, baking.

Crepe fabrics made of natural silk include crepe de chine, crepe georgette, crepe waffle, crepe chiffon, crepe satin, feyeshin, crepe perizens. The use of highly baked yarns in the left and right directions as body or back yarns results in granulation on the surface of the fabric after the finishing process.

It is known that crepe fabrics use crepe yarns in the right and left twists at the same time. Typically, the fabric is woven in pairs in the direction of the twist, 2 threads on the right twist, 2 threads on the left twist. In crepe de chine, raw silk yarn is used as a tanda.

In recent years, new types of crepe fabric and their production technologies have been created, consisting of low-twisted baked yarns as tanda yarns to increase the efficiency of the selection process, improve the physical and mechanical properties of tan yarns, create opportunities to use tanda monitors on the loom.

In this regard, it is of great importance to study the resistance of low-twisted natural silk yarns prepared for weaving to multi-cycle elongation deformation.

It is known that the multi-cycle deformation forces acting on materials are much less than the durability of the material in terms of quantity. However, as a result of these forces being exposed many times over a long period of time, complex changes in the structure of materials are formed and decomposed.

A pulsator laboratory instrument brand PN-5 (Fig. 3.12) was used to determine the resistance of multi-cycle elongation deformation of low-twisted natural silk yarns prepared for weaving. In this device, the multi-cycle elongation of the threads is carried out by the sinusoidal law.

When using the PN-5 tool, the tested yarn was fastened between the clamps and a static load was hung on the lower part of the yarn, which weighed 25% of the yarn strength [60].

Figure 1. Appearance of PN-5 pulsator device

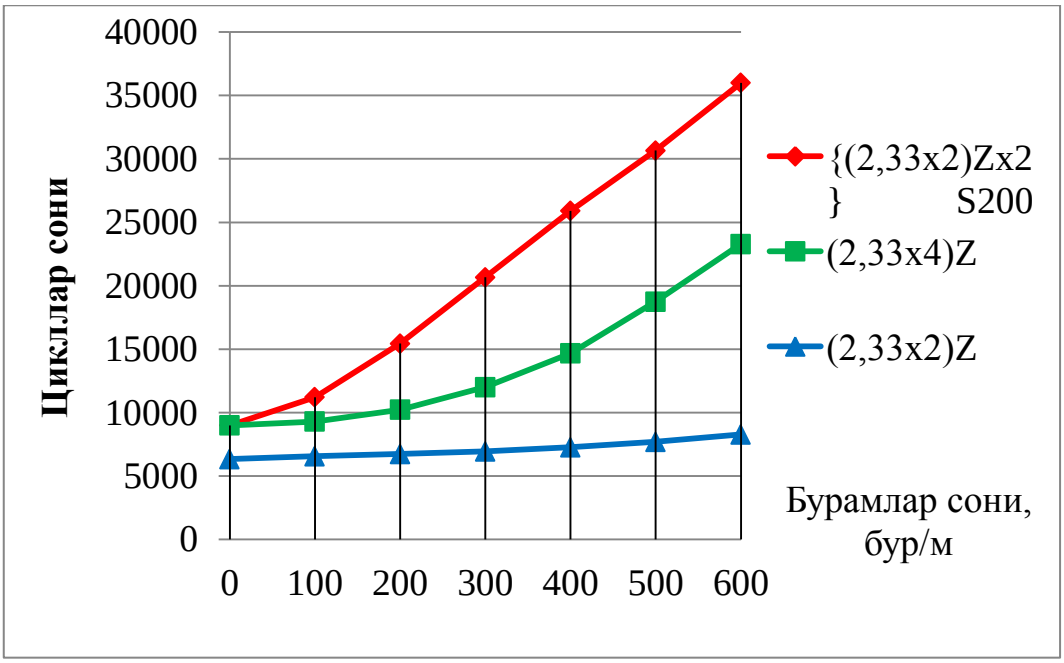
[1] Assistant of the Fergana Polytechnic Institute

2.33 tex x 2 and 2.33 tex x 4 twists prepared for weaving without twisting and 100 - 600 twists / meter less twist Experiments were performed 24 times on each sample on 5 pulsator laboratory equipment and the results are given in Table 3.2 below. Figure 2 shows the dependence of the resistance of natural silk yarns to multi-cycle elongation deformation on the number of twists.

The analysis of the results obtained on the resistance of low-twisted natural silk yarns to multi-period elongation deformation (Table 1, Fig. 2) shows that their strength increases when yarns are added and twisted.

In this case, the resistance of the yarn to multi-cycle elongation deformation is 2.33 tex x 2 layers and 2.33 tex x 4 layers, which are not twisted, averaging 6336 and 8991 cycles, respectively. Increased 56 times, 100 - 600 twists / meters less twisted 2.33 tex x 2 layers and 2.33 tex x 4 layers in ordinary baked yarns with an average of 7245 and 14708 cycles without twisting

2.33 tex x 2 layers and 2.33 tex x 4 layers increased by 14.35 and 63.59%, respectively, compared to the added yarns, 2.33 tex 4 layers were intricately woven ({(2.33x2) Zx2} S200) in yarns, the average was 23,312 cycles, an increase of 3.15 times compared to non-twisted 2.33 tex x 4-ply yarns, and their advantage over ordinary baked yarns was evident.



2-picture. The resistance of natural silk yarns to multi-cycle elongation deformation depends on the number of twists

Multi-cycle elongation deformation resistance of natural silk yarns

Table 1

№	Options (Samples)	Number of cycles, average	Average squared deviation	Deviation coefficient	Reliable error	
					Absolutely	Relative %
Uncooked yarns						
1	2,33x2	6336	744	11,74	307	4,85
2	2,33x4	8991	1051	11,69	434	4,83
Two layers of plain baked yarn						
1	(2,33x2)Z100	6559	769	11,72	317	4,84
2	(2,33x2)Z200	6737	802	11,90	331	4,91
3	(2,33x2)Z300	6940	745	10,73	308	4,43
4	(2,33x2)Z400	7270	746	10,26	308	4,24
5	(2,33x2)Z500	7693	599	7,78	247	3,21
6	(2,33x2)Z600	8270	636	7,69	262	3,17
Four layers of plain baked yarn						
1	(2,33x4)Z100	9300	1083	11,65	447	4,81
2	(2,33x4)Z200	10237	906	8,85	374	3,65
3	(2,33x4)Z300	12014	919	7,65	379	3,16
4	(2,33x4)Z400	14672	1115	7,60	460	3,14
5	(2,33x4)Z500	18742	1417	7,56	585	3,12

6	(2,33x4)Z600	23285	2048	8,80	846	3,63
Four layers of intricately baked yarn						
1	{(2,33x2)Z100x2}S 200	11219	1182	10,54	488	4,35
2	{(2,33x2)Z200x2}S 200	15440	1630	10,56	673	4,36
3	{(2,33x2)Z300x2}S 200	20663	2459	11,90	1015	4,91
4	{(2,33x2)Z400x2}S 200	25898	2766	10,68	1142	4,41
5	{(2,33x2)Z500x2}S 200	30656	3619	11,81	1495	4,88
6	{(2,33x2)Z600x2}S 200	35997	4091	11,36	1689	4,69

Thus, the analysis of the results obtained on the resistance of multi-cycle elongation deformation of low-twisted natural silk yarns prepared for knitting shows that their resistance to multi-cycle elongation deformation increases when yarns are added and twisted, especially when complex twists are given. so high. Also, the higher the number of threads, the higher the resistance of the thread to multi-cycle elongation deformation, and the higher the number of turns, the faster the resistance of the thread.

Four-layer complex welded yarns were found to have high values of multi-cycle elongation deformation resistance, and their advantage over ordinary welded yarns was clearly demonstrated. It should be noted that this feature of yarns is of great importance in the production of crepe de chine fabrics, which are formed by weaving several individual yarns as tanda yarns.

Conclusion

1. Methods for determining the physical and mechanical properties of textile yarns were studied.
2. When twisting natural silk yarns, their tensile strength increases, and the higher the number of individual yarns that make up a baked yarn, the higher the strength of the yarn.
3. Deformation properties of natural silk yarns were studied using an optical device, 2,33 tex 4 layers of simple and complex twisted natural silk yarns, despite the fact that the number of added individual yarns is the same, their tensile strength is different, and this found to be taken into account.

LIST OF REFERENCES

1. Daminov's dissertation on "Creation of new types of crepe based on the study of the structure of decorative fabrics." TTESI Tashkent-2019. 9- b.
2. V.A.Usenko. Pererabotka ximicheskix volokon: Uchebnoe posobie dlya vuzov / - M. : Izd-vo Legkaya industriya. 1975. - 116 p.
3. X.N.Lukmanov. Sovershenstvovanie struktury tkani iz naturalnogo shyolka. Tez.dok.vsesoyuznoy nauchno-tex.konf. "New in technology and technology of textile production." Ivanova, 1990. - 170 p.