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Research Technology of Manufacturing Twisted Threads for Natural Silk Costume Fabrics

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ABSTRACT: The textile industry processes fiber into the spun yarn, fabric and other textile products. In turn, textile factories are divided into several types of fibers, from which the silk industry is an important industry of the national economy. Natural silk is used in production of garments, sheets, cloths, scarves, tableware and other products of the national economy. As the materials made of natural silk have high sanitary and hygienic properties, they are comfortable, durable and good-looking, which make them one of the most valuable textile products in the world. At the same time, the limitation of the raw material base, the complexity of the processing technology and the inappropriate use of the raw material make the products expensive.

KEYWORDS: raw silk, twisted yarn, plan of twisting, twisting processes, material for suit..

I.INTRODUCTION

The raw material for the production of natural silk is the silkworm cocoon. The effective use of cocoon raw materials is one of the most important tasks of the silk industry. There are many factors affecting the process of silk producing from the cocoon. They include methods of worm breeding and horticulture, feeding conditions, cocoon drying, weather conditions and moisture. Finding an alternative to these is a matter of concern, and the right chose is a guarantee of the quality of the finished product.

In order to solve these problems, based on the Decree of the President of the Republic of Uzbekistan from March 29, 2017, the following tasks have been set for the rapid development of the sphere after the establishment of the Association "Uzbekipaksanoat". In particular, it is planned to produce high quality cocoons, primary processing, organization and modernization of existing capacities for the production of raw silk and silk yarn, processing of cocoons, increasing the volume of finished products from silk, to produce the most popular types and designs, to provide certification and standardization of products in accordance with international standards, to effectively organize the work on widespread introduction of modern methods of quality management, to carry out marketing research on expansion of product markets, develop recommendations on creating an optimal mechanism for the formation of silk products, increase exports [3].

Based on these tasks, it is very important to prepare raw silk, yarns of different assortments, and to produce suiting fabrics.
As a research object a silk yarn for suiting fabric was obtained from cocoon, raw silk and natural silk. On the basis of the "Silk Technology" department of TITLI and in the educational-scientific laboratory under the department "Textile Materials Science" the quality indicators of silk yarn were obtained on the basis of modern methods. The silk industry produces a variety of fabrics. These include fabrics of various assortments for shirts, suits, tie, furniture, footwear, scarves, technical and other types of products. The most widespread are shirt fabrics. On the basis of scientific researches the choice of manufacture of suiting fabrics was chosen. The technology of natural silk yarn was studied for the suiting fabrics.

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II. SIGNIFICANCE OF THE SYSTEM

So far, more and more attention is paid to the production of fine and elegant fabrics from natural silk. But nowadays, much attention is paid to the expansion of the range of silk fabrics. In our research, we have developed a silk yarn for fabrics that are heavier than the previous manufactured fabric, which can be used as outwear garments. To produce required fabric from natural silk, a raw silk with linear density 3.23 tex was produced from the silkworm cocoons produced locally, but imported seeds, at the Uzbek-Chinese JV Bukhara Brilliant Silk. Accordance of raw silk to the state standard was identified (Table 1.)

Table 1
Quality characteristics of raw silk produced by new technology

Indicators	Real indicators of 3,23 tex raw silk	Accordance to the state standard O‘zDSt 3313-2018
Linear density deviation (tex)	0,15	3 A
1- unevenness	70	4 A
2- unevenness	15	3 A
Largedefectscleansing, atleast, %	97,9	4 A
Minimizing minor defects, at least, %	88	A
Worst cleanliness, at least %	90	4 A
Maximum deviation, (tex)	0,58	A
3- unevenness	0	4 A (1-class)
Rewinding, number of interruptions	14	2 A (3- class)
Breaking load, cN/tex	30	A (1- class)
Elongation, (%)	18,2	A (1- class)
Connectivity, number of pallets, pallets, pcs	154	A (1- class)

The results show that the crude raw silk sample was of class A according to its quality characteristics, while the number of rings during the re-packing was very low, and the process of finding the endless tip of the noncrossed clay was diminished. This cluster method indicates that the processing of the cow straws is effective. At the same time, the possibility of producing high-quality yarn yarn with straight line density increases from raw silk.

III. LITERATURE SURVEY

Today's demand is the production of silk yarns of different assortments of raw silk. We have received raw silk from a new assortment of silk produced in our research work.

The twisted silk of the Uzbek-Chinese joint venture "Bukhara BRILLIANT SILK" of 3,23-tex raw silk was manufactured with the basis of a semi-finished rope yarn for the suite fabric based on the following technological sequence (Table 2).

Table 2
Plans for twisting silk yarn production from raw silk

№	Technological processes	Equipment brand	Technologicalparameters
1.	Sort and group them	By hand	
2.	soak the yarn	AZSHC-2	T=40-42 °C t=60-120 min
3.	Wring out	Centrifuge -150	t=15 min
4.	Training and correction	By hand	
5.	Drying	KC-2	T=40-42 °C

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			t=60-120 min		
6.	Rest	In room	T=22-26 °C W= 65-75 % t=3-8 hour		
7.	Rewinding	MT-85	ϑ= 200 м/мин		
8.	Add 4 threads to yarn and twisted 100 tw/m of yarn. Then, four of these yarns are joined and twisted to the Z side	TFO	Ktw/m (S,Z)	ϑ=m/min	n_{ur}
			200	45	9000
			400	22	9000
			600	15	9000
9.	Balancing the twists	SC-750	T=65-70°C t=30 min		
10.	Rest	In room	T=22-26°C W= 60-70 %		
11.	Rewinding to hangs	HM-3	ϑ=180-240 м/мин		
12.	Drying and rest	In room	T=22-26°C; W= 60-70 % t=12-18 hour		
13.	Rewinding and packaging				
14.	Controlling and storage	In the stock	T=22-26°C; W= 60-70 %		

It is possible to increase the odor of the yarns or to give the thread an external effect on by twisting. By returning different degrees, it retains the previous aging or loses its relative fatigue. At the same time, the linear density of the yarn and the reduction in the spin will change a result.

We have studied the effect of the number of joints in the nonlinearity of yarn in our research (Table 3).

We have determined the absolute inaccuracy of the yarn's thickness by the following equation.

$$S_{tw} = S_{iy}\sqrt{n}$$

S_{tw} - the thickness of absolute unevenness of the yarn,
S_{iy} - the thickness of individual yarns,
n - number of joins.

Table 3.
Impact of the number of joints in the porosity of yarn

Number of joins, pcs	The thickness of absolute unevenness of the yarn, %
1	6
2	4,2
3	3,45
4	3,0
5	2,65
6	2,15
8	2,00
10	1,0
12	0,75
14	0,25
16	0,11

The results show that the increase in the number of joints of yarn leads to improved linear density of yarn.

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IV. METHODOLOGY

It is possible to expand the range of yarns by giving a variety of twist. In our work, we have learned the effect of twist on high linear density yarn. The yarn spinning will reduce the length of the yarns. Silk shrinkage affects the linear density of the yarn. The decline in silk yarns is calculated by using G.N.Kukin's formula. Indicators of different twisted yarns were found. (Table 3, picture 1).

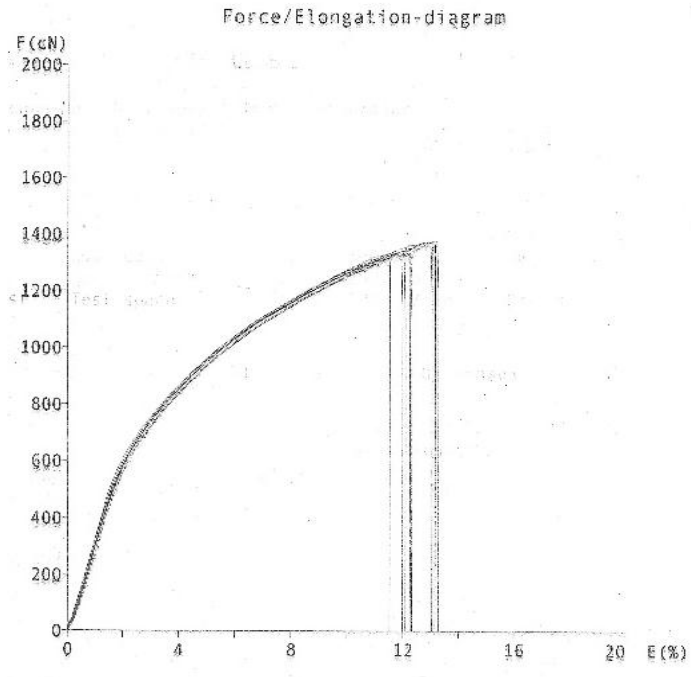
Table 3
Indicators of various yarns

Indicators of silk yarns	Number of twists on the yarns, tw / m		
	200	400	600
Diameter, mm	0,24	0,24	0,25
Radius, mm	0,17	0,17	0,17
shrinkage	0,001	0,001	0,001
Linear density, tex	51,10	53,0	55,90
Breaking load cN	26,43	21,47	20,64
Elongation, %	12,6	8,67	10,10

The results show that the number of twists influenced the linear density.

V. EXPERIMENTAL RESULTS

When the number of twists was 200, 400, 600 tw / m, the shrinkage of the yarn was 0.001.



a) 200 tw/m

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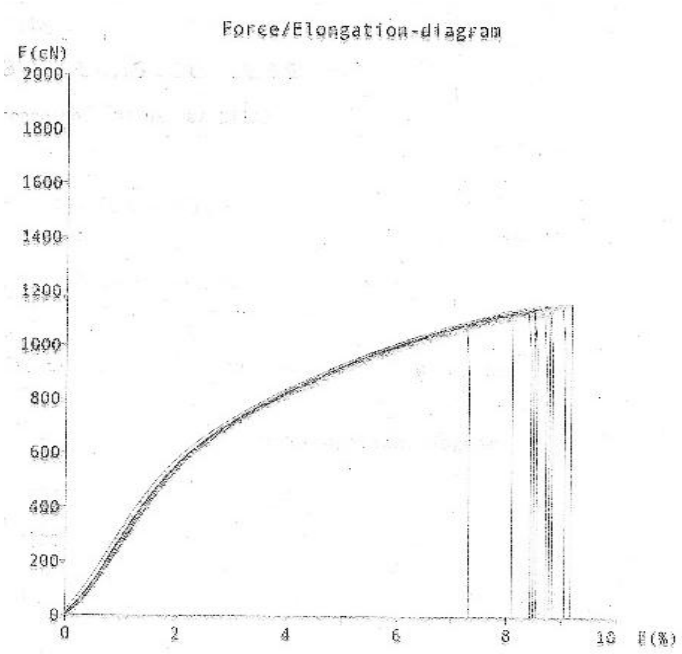
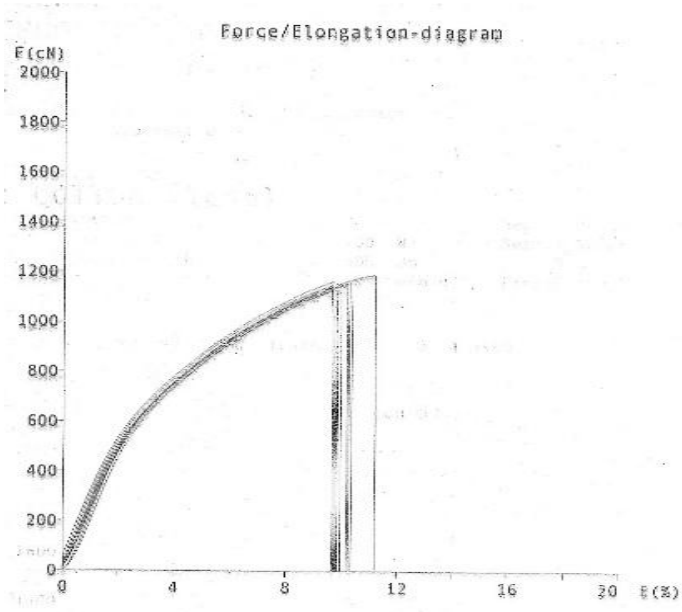


б) 400tw/m



в) 600 tw/m

Picture 1. Indicators of various twisted yarns

The results show that the increase in the linear density and the increase in the number of occurrences lead to a reduction in the number of inclusions. It has also been found that the increase in the number of hinges increases the reliability of the relative discontinuity and decreases the length of the delay.

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VI.CONCLUSION AND FUTURE WORK

The Uzbek-Chinese joint venture BUKHARA BRILLIANT SILK was found to be Class A on the quality criteria of the raw silk sample, which was removed from the cluster seeds from China and dropped from local clay.
The twisting plan for the suiting fabric was made of 3,23tex raw silk and silk yarn of various twist was obtained.
The absolute inaccuracy of the thickness of yarns is determined and the increase in the number of joints leads to the improvement in the linear density of the yarn. This is the production of suiting cloths of 600 tw/m.

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