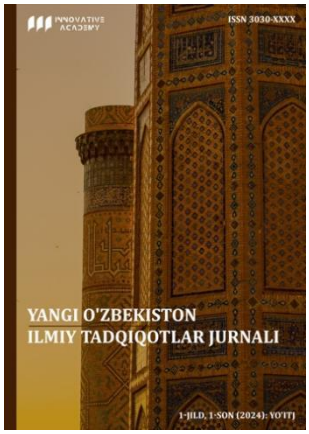

CHANGES IN THE QUALITY INDICATORS OF YARNS OBTAINED FROM A MIXTURE OF COTTON AND SECONDARY FIBERS WITH DIFFERENT COMPOSITION

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ABSTRACT

Article physico-mechanical properties of yarns obtained by a pneumomechanical spinning machine from fibers of different composition were studied, in which the fiber content of the yarn: 25% secondary fiber from the yarn + 75% cotton fiber, 20% secondary fiber + 80% cotton fiber, 30% secondary fiber + 70% cotton fiber, The effect of twists of 400 br/m, 500 br/m, 600 br/m on the properties of yarns made of 15% secondary fiber + 85% cotton fiber was determined.

In order to produce high-quality gauze from cotton fiber, it is necessary to produce high-quality yarn. In order to produce high-quality yarn, spinning enterprises must have well-organized and constantly functioning technical control.

Unevenness is a negative property of production products at a spinning enterprise, and often has a negative effect on the technical and economic indicators of the enterprise, as well as on the physico-mechanical properties of the yarn. It is important to test and control the unevenness of the products in spinning production, and it determines the causes and time of the unevenness. In spinning machines, the more breaks during the winding and forming of the threads, the higher the unevenness of the thread. As a result of the increase in breakage of threads, the employment of workers increases, and it leads to a decrease in the productivity of the machines.

The unevenness of the linear density of the product at the spinning plant is one of the main negative indicators of quality. This indicator affects the level and unevenness of various properties of yarn. In addition, the influence of the fiber content on the unevenness indicators of yarns is also significant. The more chemically synthetic fibers the threads are made from, the less uneven they are.

Fiber length, tensile strength and linear density are important in the production of quality yarn in a spinning plant. The higher the quality of the fiber, the more competitive it can be to produce quality yarn that meets demand. For this, it is necessary to choose the right raw materials, and in addition, to create optimal conditions for the processes of storing, drying, cleaning, ginning, and fiber cleaning of seeded cotton in cotton ginning enterprises.

The quality of the finished products largely depends on how smoothly the spun threads are processed. If the unevenness of the thread is high, its relative breaking strength will decrease, which means that the fabric woven from it will be less tough. One of the main reasons for

unevenness is that the amount of components in the mixture of fibers is not constant, they are not well mixed.

The main indicators of threads include tensile strength, specific tensile strength, and roughness indicators.

For this reason, in the production of high-quality and low-cost items, measures were taken to effectively use scraps without throwing them away. After processing the scraps, the fiber was spun and staples were formed. Linear density, tensile strength, specific tensile strength, staple mass length and short fiber content of the prepared sample were determined in laboratory conditions.

The linear density of the secondary fiber was 171 mtex, the breaking strength was 3.7 sN, 21.6 sN/ tex, the length of the staple mass was 23.5 mm, and the amount of short fibers was 25.4%.

In the process of production of sewing products, the scraps produced during the preparation of the product were processed, cotton fibers were mixed with secondary fibers, and the results of the tests are presented in tables 3.1-3.3.

25% secondary fiber + 75% cotton fiber yarn, 20% secondary fiber + 80% cotton fiber yarn, 30% secondary fiber + 70% cotton fiber yarn, 15% secondary fiber + 85% cotton fiber yarn from the pneumomechanical spinning machine. Changes in the physical and mechanical properties of yarns with different number of twists are presented in Tables 1-3 below.

Table 1

Changes in physical and mechanical properties of yarns obtained from a mixture of cotton and secondary fibers (400 br/m)

t/r	Indicators	Mixture of cotton and secondary fibers in yarn,%			
		25% secondary fiber+75% cotton yarn	20% secondary fiber +80% cotton yarn	30% secondary fiber +70% cotton yarn	15% secondary fiber +85% cotton yarn
1.	Linear density of thread, tech	60,8	61,50	60,0	61,10
2.	Coefficient of variation in linear density of yarn, %	4,12	3,26	4,57	3,10
3.	The number of twists of the thread, br/m	400	410	405	407
4.	Coefficient of variation in the number of twists of the thread, %	6,7	5,9	6,9	5,7
5.	Breaking strength of the thread, sN	323,8	367,5	311,9	398,2
6.	Coefficient of variation in thread breaking strength, %	6,75	6,12	8,80	5,66
7.	Specific tensile strength of the thread, sN/tex	5,32	5,97	5,19	6,5
8.	Elongation of thread at break, %	10,76	11,22	11,9	10,98
9.	Coefficient of variation in elongation at break, %	12,44	11,95	13,76	11,87

Table 2

Changes in physical and mechanical properties of yarns obtained from a mixture of cotton and secondary fibers (500 br/m)

t/r	Indicators	Mixture of cotton and secondary fibers in yarn,%			
		25% secondary fiber+75% cotton yarn	20% secondary fiber +80% cotton yarn	30% secondary fiber +70% cotton yarn	15% secondary fiber +85% cotton yarn
1.	Linear density of thread, tech	60,3	60,50	60,8	60,7
2.	Coefficient of variation in linear density of yarn, %	3,78	3,12	4,12	2,98
3.	The number of twists of the thread, br/m	505	520	515	518
4.	Coefficient of variation in the number of twists of the thread, %	6,2	5,67	6,5	5,44
5.	Breaking strength of the thread, sN	360,12	410,30	376,11	465,23
6.	Coefficient of variation in thread breaking strength, %	6,97	6,78	7,45	4,98
7.	Specific tensile strength of the thread, sN/tex	6,82	7,39	6,19	7,66
8.	Elongation of thread at break, %	10,56	10,45	10,78	9,56
9.	Coefficient of variation in elongation at break, %	11,44	10,45	12,5	9,86

Table 3

Changes in physical and mechanical properties of yarns obtained from a mixture of cotton and secondary fibers (600 br/m)

t/r	Indicators	Mixture of cotton and secondary fibers in yarn,%			
		25% secondary fiber+75% cotton yarn	20% secondary fiber +80% cotton yarn	30% secondary fiber +70% cotton yarn	15% secondary fiber +85% cotton yarn
1.	Linear density of thread, tech	60,6	60,0	60,5	61,0
2.	Coefficient of variation in linear density of yarn, %	4,02	3,45	4,47	3,12
3.	The number of twists of the thread, br/m	612	608	610	598
4.	Coefficient of variation in the number of twists of the thread, %	6,12	5,86	6,88	5,67
5.	Breaking strength of the thread, sN	330,6	398,8	356,7	420,4
6.	Coefficient of variation in	7,56	7,44	8,12	5,12

	thread breaking strength, %				
7.	Specific tensile strength of the thread, sN/tex	5,45	6,64	5,90	6,89
8.	Elongation of thread at break, %	11,8	10,24	10,56	10,1
9.	Coefficient of variation in elongation at break, %	11,78	11,02	12,98	10,8

As can be seen from the analysis of the research results, with the decrease in the content of secondary fibers and the increase in the number of twists, the coefficient of variation in the linear density of the yarn is from 20.87% to 22.38%, and the coefficient of variation in the number of twists is from 7.3% to 11 decreased to .9%, tensile strength increased from 11.89% to 21.3%, coefficient of variation of tensile strength decreased from 9.3% to 32.27%, specific tensile strength increased from 10.88% to 20.89 %, elongation at break increased from 4.1% to 14.4%, coefficient of variation for elongation at break decreased from 3.9% to 8.32%.

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