ANALYSIS OF THE IMPACT OF FIBER AND YARN ON THE QUALITY INDICATORS OF CARPET PRODUCTS

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Annotation: In this article, we have studied to what extent cotton fiber affects quality indicators in the process of cleaning cotton at the UHK unit with large impurities. At the same time, tables and graphs were formed on the UHK unit to what extent they affect the quality indicators and the fiber quality indicators of these samples were identified in the HVI system, taken for a sample after cleaning raw cotton.

Keywords: cotton raw materials, coarse impurities, cleaning, UHK unit, cotton fiber, HVI system, quality indicators, fine impurities.

АНАЛИЗ ВЛИЯНИЯ ВОЛОКНА И ПРЯЖИ НА ПОКАЗАТЕЛИ КАЧЕСТВА КОВРОВЫХ ИЗДЕЛИЙ

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***Аннотация*:** В этой статье изучено, в какой степени хлопковое волокно влияет на показатели качества в процессе очистки хлопка на агрегате УХК при крупных примесях. При этом на агрегате УХК сформированы таблицы и графики по тому, в какой степени они влияют на показатели качества и

выявлены показатели качества волокон этих образцов в системе HVI, взятые на образец после очистки хлопка-сырца.

Ключевые слова: хлопковое сырье, крупное примесей, очистка, агрегат УХК, хлопковое волокно, система HVI, показатели качества, мелкие примеси.

In our country, comprehensive measures are being implemented to develop the cotton growing sector, modernize and technically re-equip cotton ginning enterprises, increase the profitability of production and processing of cotton raw materials, as well as the competitiveness of manufactured products, including: Decree of the President of the Republic of Uzbekistan No. PF-60 dated January 28, 2022 “On the Development Strategy of the New Uzbekistan for 2022-2026”, which sets the task of “...Ensuring the stability of the national economy and continuing the industrial policy in the new domestic product, with the aim of increasing the volume of industrial products by 1.4 times, while increasing the volume of textile industry products by 2 times...” In implementing these tasks, including in the process of primary processing of cotton at cotton ginning enterprises, effective cleaning without damaging seeds and fibers is one of the important issues.

In cotton ginning enterprises belonging to cotton textile clusters, fiber damage due to impact forces applied to cotton raw materials and forces generated during friction of cotton is one of the biggest problems in the primary processing of cotton. A lot of work is being done in our country to eliminate these problems, and scientific work is being done by researchers. However, this work is not enough.

Taking these into account, this article investigated the damage to the fiber during cleaning, one of the largest processes that cause fiber damage. In the study, experiments were conducted on the length of the fiber, uniformity in length, ripeness, elongation at break, fiber fineness and ripeness, color and contamination indicators of the cotton raw materials before and after cleaning in the UXK type cotton cleaning unit. The experiments were conducted at the “Turakurgan Cotton

Cleaning" enterprise affiliated with "Namangan To'kimachi Cluster" LLC on the 3rd grade 1st grade cotton raw materials with a moisture content of 13.4%, a contamination content of 16.8%, and the selection variety Bukhara-102, and the samples taken before and after cleaning in the UXK unit were determined in the HVI system 9 times and the average results were obtained.

We observed that the light reflectance coefficient (Rd) of the cotton fiber sample tested was the highest at 68.4 and the lowest at 61.8, and the yellowness level (+b) ranged from 6.8 to 9.9. We calculated all of the values listed in Table 1.1 above and took the average value, resulting in the following Table 1.1.

Table 1.1

№ №	Indicator unit of measurement	Measurement	Permissible systematic error, max.	Mean squared difference, at most
1	Micronaire indicator (Mic)	4.2	0.04	1.04
2	Relative tensile strength (Str)	34.4	1.41	4.09
3	Upper Average Length (Len)	1.20	0.02	1.32
4	Uniformity index along the length (Unf)	87.3	0.78	0.90
5	Short Fiber Index (SFI)	3.6	1.14	31.56
6	Elongation at break (Elg)	6.6	0.29	4.35
7	Number of impurities (Cnt)	58	9.73	16.84
8	Area of contaminated mixtures (Area)	3.0	0.95	31.75
9	Light reflection coefficient (Rd)	65.8	2.36	3.59
1	Yellowness level (+b)	8.5	1.04	12.28

In Table 1.1above, we have obtained the average value of the results (Table 1.1) of 9 tests (Table 1.1) on the HVI system, where the cotton fibers were manually separated from the seeds before being cleaned of impurities in the UXK unit. Then, the same 3rd grade, 1st grade, Bukhara - 102 selection grade cotton that was tested above was cleaned in the UXK unit.

We observed that the light reflection coefficient (Rd) of the cotton fiber sample tested was the highest at 71.4 and the lowest at 65.4, and the yellowness

level (+b) was from 6.7 to 10.1. We analyzed Table 1.3 and calculated the average of our 9-fold sampling to form Table 1.2.

Table 1.2

№	N	Indicator unit of measurement	Measure ment	Permissible systematic error, max.	Mean squared difference, at most
1		Micronaire indicator (Mic)	4.2	0.07	1.68
2		Relative tensile strength (Str)	36.0	1.48	4.10
3		Upper Average Length (Len)	1.20	0.02	1.61
4		Uniformity index along the length (Unf)	86.6	1.49	1.71
5		Short Fiber Index (SFI)	3.8	1.03	27.00
6		Elongation at break (Elg)	6.8	0.35	5.12
7		Number of impurities (Cnt)	26	4.27	16.55
8		Area of contaminated mixtures (Area)	1.4	0.52	36.59
9		Light reflection coefficient (Rd)	67.6	2.05	3.03
1		Yellowness level (+b)	8.7	0.95	11.00

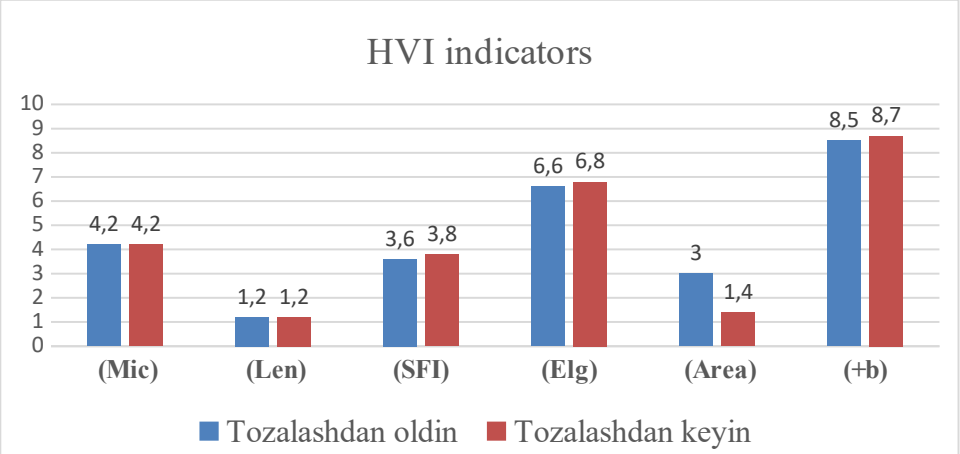

Figure 1. Graph based on results obtained in the HVI system

Figure 1 shows the micronaire index, average length, short fiber index, elongation at break, area of impurities and yellowness levels of cotton before and after cleaning in the HVI system of the UXK aggregate. It can be seen that the micronaire index and average length before and after cleaning did not affect the quality levels. However, we found that the elongation at break and yellowness levels also increased as the short fiber index increased by 0.2 percent after

cleaning. As can be seen in the graph, we can see that the specific linear strength increased after cleaning, the linear uniformity index decreased after cleaning, and we found that the number of impurities also decreased and increased.

In conclusion, when examining cotton fiber in the HVI system during the cleaning process of cotton raw materials in the UXK unit, the micronaire index and the high average length did not affect the quality levels. We found that the short fiber index, elongation at break, yellowness level, specific linear strength, and light reflectance coefficient increased. We also saw that the area of impurities, the length uniformity index, and the number of impurities decreased after cleaning in the UXK unit .

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