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# **Providing the Durability of Enterprise Worker's Overalls Details**

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**ABSTRACT:** The article is sanctified to research of durability of thread connections of details' of overalls from the cottoned of home production by a superficial closeness 210 and 220 g/m<sup>2</sup> treat a polymeric composition component for working productive enterprises and to development of recommendations of recommendations rational parameters of thread guy-sutures.

**KEYWORDS:** special clothes, strength of a seam, thread connection, surface density, stitch length, cotton fabric, and polymeric composition component.

## **I. INTRODUCTION**

Improving the quality of manufactured overalls is associated with the need to use high-quality textile materials and bags with known physical, mechanical and technological properties [1]. Currently, imported fabrics are expensive, beside this, the fiber composition does not meet the requirements of work clothes for workers of manufacturing enterprises in the climatic conditions of Uzbekistan. In addition, one of the main directions in improving the quality of overalls is to increase its durability, since extending the service life of overalls is equivalent to increasing its output without attracting additional material and labor resources.

The purpose of an objective assessment of materials and clothing packages, as well as the scientific justification of recommendations for their use, is one of the most important in terms of improving the hygienic and consumer properties of developed clothing for a specific purpose and improving the quality of these products.

## **II. RELATED WORKS**

In terms of given the above, at the Department of Design and Technology of Sewing Products, research work is underway to develop new overalls for employees of manufacturing enterprises from domestic cotton fabric with different colors, since this material has all the relevant necessary properties: it provides timely air exchange, is hygroscopic, does not create inconvenience in body movement [2].

The main goal in the manufacture of overall from domestic cotton fabrics for manufacturing enterprises workers is to increase its wear resistance. The topography of these products is complex and specific. First of all, the durability is lost on bending of the cuffs and collar, sleeves in the elbows, trousers in the knees. Based on this, the following technological operations were used to form work wear: direct stabilization of the reverse side of the amplifier by applying polymer compositions, tuning of amplifiers (knee pads, elbow pieces) in the area of the knees and elbows. The designed work wear should protect the human body not only from external factors, but also serve as a protective cover, allowing reducing injuries from cuts, bruises.

At the same time, the correct choice of the design of the connecting seams when assembling the units of the designed clothing is of great importance. The reliability and durability of the new workwear will depend on their strength. But the main thing is to set the processing mode on the sewing equipment, when such a parameter as the stitch length in the line is optimized.



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## III. METHODS

The objective of the study is a way to improve the strength of the seams of overalls when using a polymer composition based on collagen in order to improve operational properties. The technological process involves applying the developed composition of the polymer composite component (PCC) based on collagen to the inverse side of the amplifier by direct stabilization in order to improve operational properties.

The flow rate of the technological solution was 30-40 ml per sample  $150 \times 250$  mm. Naturally drying way was used [3].

In the manufacture of clothing, it is necessary to take into account the purpose of the thread connections and the various requirements for them.

Due to the unequal purpose of the thread connections and the difference in the nature and magnitude of the perceived loads, the optimal quality indicators of the thread connections change.

## IV. ALGORITHM USED

The mechanical properties of thread connections are affected by the design of the seams, the width of the material allowances for the seams, the number of lines in the seam, as well as the technological modes of stitching: the frequency of stitches, the type and tension of the threads, the weakening of the strength of the threads and the materials being sewn during sewing.

The strength of the seam ( $K\Pi\Pi$ ) is determined by the efficiency of the seam according to the following expression:

$$K\Pi\Pi = 100 P_s / P_m,$$

where,  $P_s$  and  $P_m$  – loading of seam and materials [4].

The breaking load of thread connections and seams depends on a number of factors, more on the type of seam and the length of stitches in the stitch. The strength of the threads also has a prevailing effect on the breaking load of the thread compounds. The stronger the thread, the theoretically should be stronger and the stitch made by this thread.

In the given work, an attempt was made to create durable seams for connecting parts of clothing from fabrics with impregnation of PCC. In this case, special attention was paid to the types of sewing threads (raw material composition, twist). In the work, sewing threads of the brand “44LX-1” were proposed. The strength of the filament seam using the “44LX-1” sewing thread was determined on a “STATIMATC” tensile testing machine [5].

As the objects of study, cotton fabrics with a surface density of 210 and 220 g/m, used in the manufacture of overalls for workers of manufacturing enterprises, were selected. It was found that the stitch length when sewing garment parts is within 3-4 mm by using the “44LX-1” sewing thread, needle number 90-100, with a material thickness of 0.4-0.5 mm. Workwear parts were connected with the proposed sewing threads under standard conditions. The breaking load of stitch filament seams was determined according to the standard method [5].

## V. RESULTS

Table 1 and Figure 1 show the results of studies of the strength of the seams when connecting parts of overall.

Table 1  
Strength characteristics of thread seams in overalls

Fabric type	Fabric surface density ткани, г/м <sup>2</sup>	Stitch length, мм	Breaking load, N							
			1 experiment		2 experiment		3 experiment		average	
			without PCC	with PCC	without PCC	with PCC	without PCC	with PCC	without PCC	with PCC
Fabric for overall gabardine	220	3	105	120	102	116	105	122	104	119
	210		92	115	96	114	91	116	93	115
	220	3,3	105	121	108	124	110	123	108	123
	210		100	121	99	120	95	115	98	119
	220	3,5	101	112	83	95	86	99	90	102
	210		93	100	85	98	90	101	89	100
	220	4	86	102	80	93	89	103	85	99
	210		85	98	87	98	85	99	86	98

An analysis of the data shows that when connecting parts from cotton fabric with a surface density of 220 g / m<sup>2</sup>, the maximum strength of the seam is reached Q = 108 N, and a fabric with a polymer composition - Q = 123 N with a stitch length of L = 3.3 mm, and with using cotton fabric with a surface density of 210 g / m<sup>2</sup>, the maximum strength of the seam is provided by Q = 98 N, and a fabric with a polymer composition Q = 119 N with a stitch length of L = 3.3 mm.

The breaking load of samples of cotton fabric with a surface density of 220 g / m<sup>2</sup> with a polymer composition with a stitch length of 3.3 mm is 3.3% higher, and for cotton fabric with a surface density of 210 g / m<sup>2</sup> with a polymer composition - 3.4% higher than with a stitch length of 3 mm.

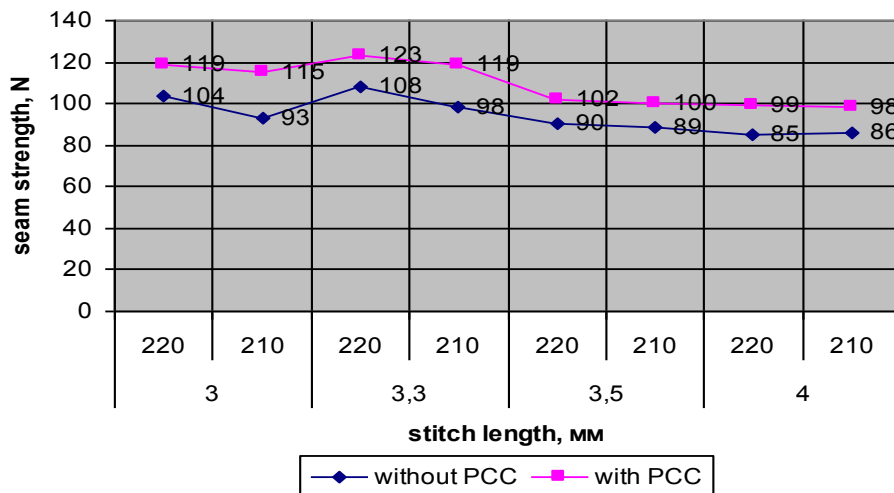


Figure.1. Dependence of the strength of the seam on the surface density of the fabric and the length of the stitch

This suggests the need to set the processing mode of parts and assemblies of special-purpose garments on sewing equipment. When connecting workwear parts, standard seams were recommended: standard seams with open cut and ironing, open seams with open cut and ironing. The specificity of the selected fabrics is determined by the operating conditions of the workwear.

According to the research results, the efficiency of the seam was calculated depending on the type of fabric. Table 2 and Figure 2 provide a comparative analysis of the strength of the seams depending on the strength of the fabric.

Table 2  
Comparative analysis of the strength of the seams

Fabric type	Stitch length, mm	Fabric surface density, g/m <sup>2</sup>	Efficiency of a seam at nominal strength cotton fabric (210 g/m <sup>2</sup> )-190 N, cotton fabric (220 g/m <sup>2</sup> )-200 N	
			without PCC	with PCC
Fabric for overalls - gabardine	3	220	52	60
		210	49	61
	3,3	220	54	62
		210	52	63
	3,5	220	47	51
		210	47	53
	4	220	43	50
		210	45	52

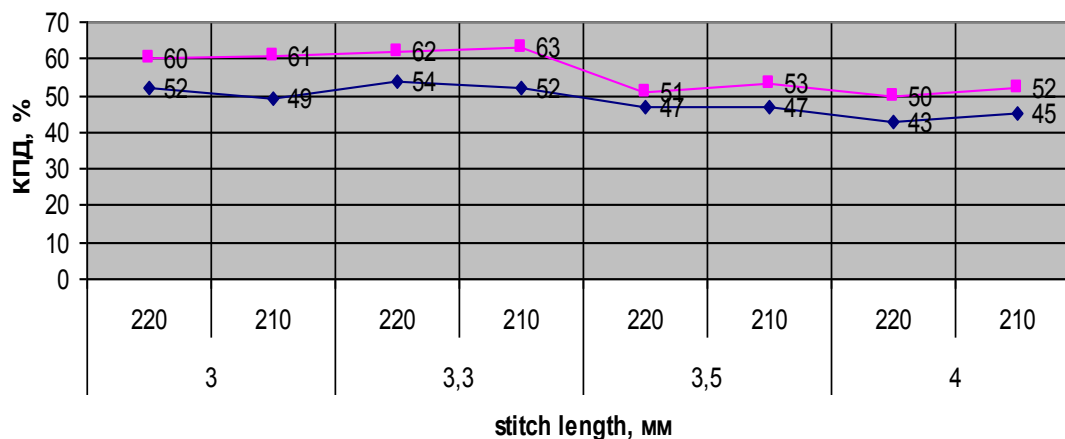


Figure.-2. The dependence of the efficiency on the surface density of the fabric and the stitch length

### VI. CONCLUSION

Thus, rational parameters of the thread connection of workwear parts were established for workers in industrial enterprises: with a stitch length of 3-3.3 mm, thread number “44LX-1”, and needle number 90-100, the seam strength increases sharply (almost 1.5 - 2 times).

In view of the foregoing, the traditional manufacturing technology of overall was adjusted. A prototype was made and an experiment was conducted on the operation of overalls at “Tiklash Tamir” LLC. As a result of testing, it was found that reliability is increased, the service life of workwear is increased, working conditions of workers are improved, and the needs of enterprises are satisfied.

### REFERENCES

1. P.P.Koketkin. Clothes. Texnology is quality. Direktory. M. 2001.
2. M.K.Rasulova. The study of fabrics for the development of new work clothes taking into account the ergonomic movements of car mechanics. Journal “Of textile problem”. 2013. № 2.
3. M.K.Rasulova. Te influence of a half-dimensional composite material on the strength of workwear packages for welders. Republican scientific and practical conference. Tashkent. 2017, 16-17 may.
4. P.P.Koketkin. Ways to improve the quality of clothing production. M. 1989.
5. Y.V. Zarnitsyn. Methodical instruction on performance of research and laboratory works on testing of production of textile appointment. Tashkent. 2007.