ISSN: 2350-0328
International Journal of Advanced Research in Science, Engineering and Technology
Vol. 7, Issue 1 , January 2020

Change of the Mechanical Properties of Fibers Produced From Bark of Mulberry Trees

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ABSTRACT: This article investigates the change in mechanical properties of the fiber, ie the elastic, elastic and plastic deformation of the bark of the white mulberry branches.

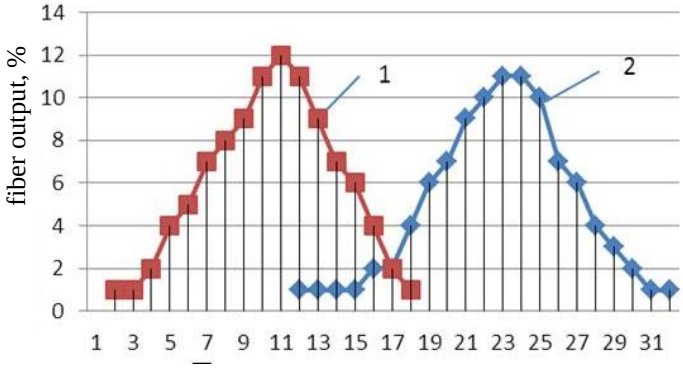
KEY WORDS:fiber, microscope, mulberry tree branches, linear density, length,fiber output, plastic deformation, resilience

I.INTRODUCTION

Some of the most pressing challenges the textile industry facing today include re-equipment of enterprises, the introduction of new technologies, the efficient use of raw materials, the full utilization of secondary raw materials and fibers, the expansion of new products, and the increase of exports.At the same time, the issue of increasing the production and the range of non-woven fabrics in the Republic of Uzbekistan is of great importance.As white cocoons are used for cocoon cultivation in our country, these mulberry horns were selected as the subject of the study.First, it was determined how many of the mulberry tree branches would remain after the leaves were sprouted from them. The research was done on newly cut mulberry tree branches [1-3].

The fibers were separated by the diameter of the tree branches. That is, the initial part of the horn is greater than 15 mm in diameter and the third of the horns is less than 15 mm in diameter [4].Under the microscope, the isolated lubricated fibers are in the form of a duck, with a thick middle and thinner sides, a thicker wall, and a gap between them.It has been observed that the fibers isolated from horns less than 15 mm in diameter are very small.

The linear density and length of the fiber were determined (Figure 1).



Fiber length, mm
1-think parts of branches, 2- thin parts of branches
Fig.1. Lubid fibers.

ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

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Textile fibers are constantly deformed during the production of yarn.In other words, the fiber and the thread are affected by the load for a period of time, after which they are released from the load. Studying the nature of materials during this load-rest process is of great practical importance.If the material is stretched under load and is not fully restored to rest, the materials of such yarn have a low elasticity, ie the material is crunchy and the shape is weak.At this time, the analysis of the physico-mechanical properties of materials is of a great importance.In one-period class, the material is exposed to loads and relaxation for a long time. As a result, the shape of the material is altered.Full-length deformation caused by single-phase elastic deformation consists of three parts: elastic deformation, resilience deformation, and plastic deformation. The first two are deformation (elastic,resilience), and the third is plastic deformation [4-6].

II. METHODOLOGY

The cause of the elastic deformation is the small distance between the particles of the polymer particles due to external forces.At the same time, the molecules and atoms are interconnected. But the valence angles grow slightly. We determined the content of complete deformation of the lube fiber obtained in our study (table 1).

1-table

Complete for lubrication of mulberry tree bark

composition of the deformation

Fiber	Completed eformation, %	Inpart		
		resilient	elastic	plastic
Fiber from mulberry wood	4,3	0,26	0,24	0,50

As a result of elastic deformation, the body size increases. The propagation of elastic deformation equals to the speed of sound. According to Prof. Kragelsky, the prevalence of elastic deformation on baked cotton yarn is 1425 m / s and in lineanis 1900 m / s. Thus, the propagation of elastic deformation on 1 m long strands passes within 0.0007-0,0005 s, which is much faster.Fiber is deformed by the change in the distance between the particles of the fibers, and the elastic energy accumulates in the strands. After removing the load, the elastic deformation returns at the same speed as above.The properties of the fibers with elastic deformation are similar to those of the rubber threads [1].

III. RESULTS AND DISCUSSION

The main reason for the elastic deformation is that when the fiber and threads are stretched, their particles of matter move smoothly in the direction of the force acting on them, and the molecules return to the groups and change their shape.Elastic deformation occurs over a period of time. This deformation is due to the process of relaxation in the structure of the fibers and threads. Relaxation is the equilibrium in the structure of the fibers and threads during stretching and relaxation. Elastic deformation develops at a small rate. Its speed depends on the environmental setting. At higher temperatures and with the absorption of water vapor, the development of elastic deformation of the fibers and threads is accelerated as the gravitational pull of the molecules decreases. Plastic deformation is also an elongation caused by the sliding or flattening of loose fibers in the threads. As a result of the work done, full deformation develops at the same time as the load on the ropes develops, but at different speeds, such as the elastic deformation as shown above, the elastic deformation increases over time. The return deformation is the same as when the rope is freed from the load. That is, the elastic deformation returns within a short time, and the elastic deformation returns within a given time [1].

IV.CONCLUSION

It is known that the fibers with the most elastic deformation component are wool and capron. Consequently, the finished products made from these threads are less wrinkled and are durable for a long time without changing their shape.The greater the flexibility and elasticity of the textile yarn, the less the crunch and the higher the durability. This suggests that lubricants isolated from thick annual branches have the potential to be used effectively in the textile industry as a natural raw material for high-line yarn production .When we analyzed the complete deformation content of the lube fibers, the elastic deformation content was 0.26, the elastic deformation content was 0.24, and the plastic deformation content was 0.50.

ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

Vol. 7, Issue 1 , January 2020

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