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# ANALYSIS OF AIR PERMEABILITY IN DIFFERENT PARTS OF MEN'S AND WOMEN'S SOCKS

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## ABSTRACT

*This article analyzes air permeability and thickness, which are important hygienic properties of men's and women's socks produced on the LONATI sock knitting machine. Differences and similarities between them were studied. The experiments were performed in the laboratory of the Namangan Institute of Engineering Technology.*

**KEYWORDS:** *Socks, Sole, Heel, Leg Part, Compensation, Air Permeability, Density, Fabric Weaving.*

## 1. INTRODUCTION

At present, knitwear produced in Uzbekistan competes with the products of developed countries in the world market. Along with increasing the export potential of the country, enterprises producing knitwear and hosiery are also meeting the needs of the domestic market. Finished products are obtained in each direction of the knitting industry. The production of socks from them is fully automated. There are wide opportunities for the production of socks in our country. Including raw materials, electricity, relatively cheap labor, and so on.

Today, no other product can replace the hosiery products of the specialized branch of the textile industry, and it has its own characteristics: good air permeability, high hygienic properties, ease of wearing, etc. Dyeing them in different colors, with the help of knitting effects, is not difficult to obtain from pure or mixed fiber yarns.

The number of loop columns on the rotation coverage of sock products is equal to the number of needles of the sock knitting machine used **[1-3].** Socks are different depending on the type of raw material, the weaving used in their formation and the method of production. Depending on the

type of raw material, socks can usually be made from cotton, artificial silk or synthetic (kapron, perlon) fiber yarns, and spun yarns such as wool and semi-wool **[4-5].**

## 2. METHODOLOGY

If the sock product is woven on single-needle sock knitting machines, then this product is formed on the basis of gladdening with a needle or a certain pattern effect. If a two-needle sock is knitted on a loom, it is usually obtained by sewing a tire with the help of a needle or a corresponding pattern. Socks with a rubber on the leg part and other parts on the basis of a glad braid are also common. The size of all socks is expressed in centimeters of the distance from the bottom of the foot to the middle of the heel.

The existence of regular, semi-regular and tailoring methods in the production of knitted goods is described in many literatures. Socks are usually finished in a regular way, that is, after knitting with some additional processes (on sewing or linking machines). In recent years, the production of socks has increased significantly. The final quality indicators of hosiery products are directly related to the specificity of all stages of the technological system of the enterprise. In particular, the volume of the first grade semi-finished product in the weaving process depends on the volume of the defective product in the sewing shop (sewing or knitting machines), the volume of re-finishing.

The main raw materials for the knitting industry are natural and artificial yarns. At present, kapron, elastic kapron, cotton yarn, wool yarn, bamboo yarn and other types of yarns are widely used in hosiery weaving shops.

## 3. RESULTS

The samples used were made of yarn with a rubber part of 110 D, a leg, heel, sole and three parts of 35 tex kapron yarn.

**TABLE 1 PHYSICAL AND MECHANICAL PROPERTIES OF MEN'S AND WOMEN'S SHOES**

| Indicators | Men | | | Women | | |
|---|---|---|---|---|---|---|
| | Heel | Sole | Leg | Heel | Sole | Leg |
| Air permeability ($sm^2$ / $sm^2$ * s) | 34,1 | 55,07 | 48,24 | 17,9 | 21,77 | 19,47 |
| Thickness (mm) | 3,46 | 3,25 | 3,23 | 3,58 | 3,44 | 3,50 |

Air permeability is one of the important hygienic properties of this sock product. Figure 1 shows the air permeability of the men's socks.

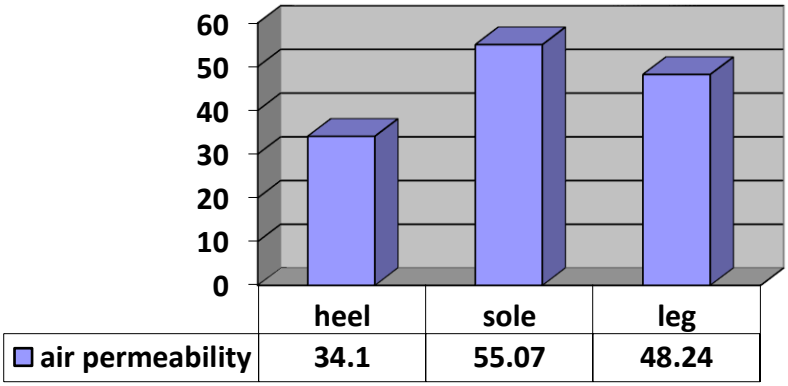


**FIGURE 1. AIR PERMEABILITY IN MEN'S SOCKS**

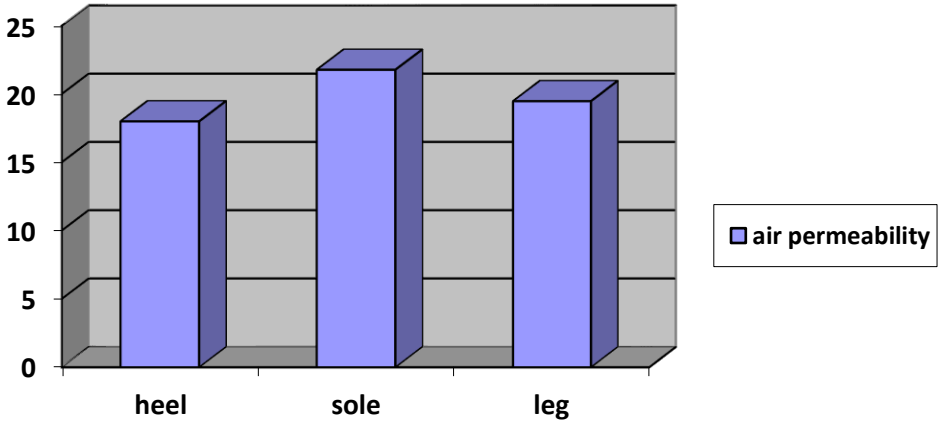


**FIGURE 2. AIR PERMEABILITY OF WOMEN'S SOCKS**

Here, due to the fact that the density is different in each part and the difference in weaving, the air permeability varies. This figure is also noticeable in women's socks (Figure 2). In both samples, we can see that less air passes through the heel of the sock. The main reason for this is its high density compared to the rest. On the contrary, despite the fact that the sole is woven with a single weave, it has a high air permeability, which is a necessary indicator for winter socks. Because in the cold months, good air permeability of socks protects against various foot diseases.

## 4. CONCLUSIONS

Air permeability was determined experimentally on the device YG461E. Conducted 5 times in accordance with the current standards GB / 5453 (ISO 9237) and ASTM D737. The air permeability scale was 8 mm in diameter and the air pressure was 100 PA. In this experiment, the properties of winter men's and women's socks made from the same raw material were studied. Experience has shown that although the thickness of the socks is almost the same, their air permeability can be different. The main reason for this is their density and type of weaving. Sock making machines vary in the number of needles depending on the diameter of the sock. The men's socks obtained in this experiment were obtained on 156-needle LONATI socks, and the women's socks were obtained on 144-needle socks. This number of needles affects the needle cylinder of the sock knitting machine, i.e. there is a difference in the number of needles due to the larger diameter of the men's socks. We have experimentally determined the effect of this change on the air permeability of socks.

## REFERENCES

**1.** Rahimov FX. Sock knitting technology, Tashkent: "Sharq", 2007. pp.24-60.

**2.** Vigelina OA. Features of the knitting process of hosiery containing elastane threads. In: Vigelina OA, Rovinskay LP. (Eds). Problems of economics and progressive technology in textile, light and printing industries: abstracts of reports. Vseros. Scientific and technical conf. Saint Petersburg State University of Technology and Design. SPb: SPGUTD, 2010.

**3.** Vigelina OA. Analysis of anthropological indications of typical figures of men for the design of hosiery. In: Vigelina OA, Rovinskay LP. (Eds). Bulletin of young scientists of the St. Petersburg State University of Technology and Design. Issue 1: Natural and technical techniques. SPb: FGBOUVPO "SPGUTD"; 2012.

**4.** Herring KM, Richie DH. Friction blisters and sock fiber composition: a double-blind study. J Am Podiatr Med Assoc., 1990;80(2):63-71.

**5.** Harpa R, Piroi C, Radu CD. A new approach for testing medical stockings. Textile Research Journal, 2010; 80(8): 683–695.