

RESEARCH ON THE AIR PERMEABILITY OF FILTER FABRICS USED IN FLOUR MANUFACTURING ENTERPRISES

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Abstract

The article is aimed at analyzing the bag filters used in flour enterprises operating in our Republic today, mainly investigating the air permeability of bag filters.

Keywords: Sleeve filters, air permeability, woven, non-woven, etc.

Introduction

In today's promising period, each sector is developing rapidly, for example, 13,276 new enterprises and organizations were established in our Republic in January-February 2024. Today, more than 100 enterprises operate within the system of the Uzdonmahsulot Joint-Stock Company. The total volume of industrial production by enterprises within the Uzdonmahsulot Joint-Stock Company at the end of 2023 amounted to 3,252 billion soums. In particular, 468.7 thousand tons of flour and 184.4 thousand tons of compound feed were produced.[1] Industrial enterprises and other sectors emit more than 2 million tons of pollutants into the atmosphere per year. Scientists are conducting scientific research to reduce the amount of these polluting dust and other substances released into the atmosphere.

At this point, we should emphasize that on April 16, at a videoconference meeting on increasing exports and investments in the textile industry, chaired by our Honorable President Shavkat Mirziyoyev, he stated in his speech that "The textile industry is widespread in all regions of the country and is one of the industries with the largest number of jobs. Today, more than 6 thousand enterprises employ 570 thousand people." [2]

Like all textile products, special filter fabrics are also being produced today. The production of special filter fabrics from natural and synthetic fibers is also finding its place in the global textile industry today. The assortment of special filter fabrics has several types: staple yarn, continuous yarn and monofilament yarn, and is used in various industries.

Air permeability of filter fabrics ГOCT P EH 779-2014, ГOCT P EH 1822-1-2010, ГOCT P 51251-99, ГOCT 12088-77 determined based on standards. [3]

ASTM D737-18, published by the American Society for Testing and Materials (ASTM), specifies a test method for measuring the air permeability of textile fabrics. This test method is applicable to many types of fabrics, including woven fabrics, nonwoven fabrics, air cushion fabrics, blankets, pile fabrics, knitted fabrics, and layered fabrics. These fabrics may be untreated, bulk, coated, resin-treated, or otherwise treated.[4]

One of the pressing problems in the manufacturing industry of our republic is the filters used in production, which are mainly imported from foreign countries. In order to solve this problem, the task was set to produce filter fabrics from local raw materials based on the characteristics of existing filters and GOST standards.

The purpose of the research work is to determine the air permeability of non-woven sleeve filters currently used in flour enterprises and to produce woven sleeve filters that comply with state standards from local raw material yarns available in our republic.

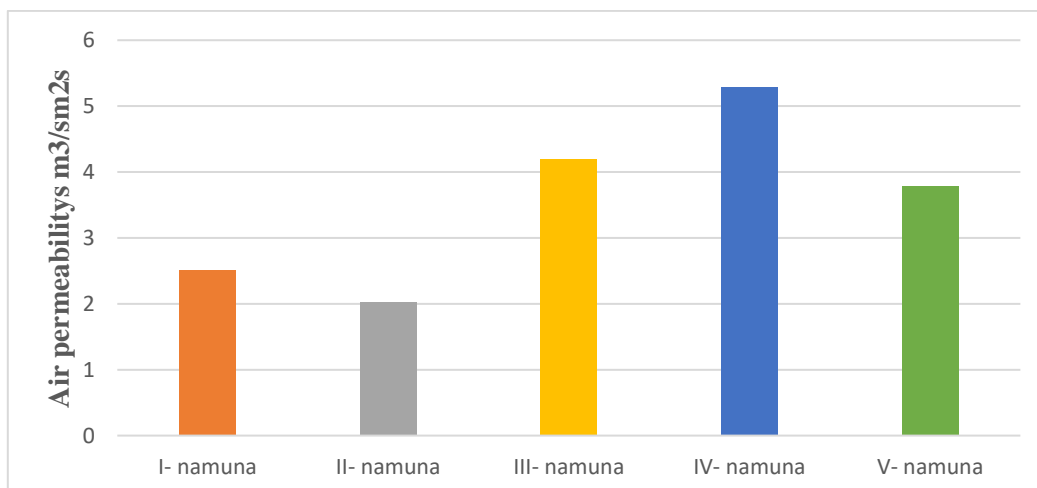
For the production of this type of filter fabric, several non-woven sleeve filter samples were taken and the air permeability of the samples was determined and analyzed in the "Cantex.uz" certification laboratory. The results of the analysis were performed using modern methods. The air permeability of the obtained samples is presented in Table 1

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№	Samples	Values
7.	I-Sample	2.51
8.	II- Sample	2.03
9.	III- Sample	4.20
10.	IV- Sample	5.29
11.	V- Sample	3.78

Air permeability of various samples

On the basis of Table 1, a histogram of the air permeability of the results obtained from various samples was developed, and experimental samples "Cantex.uz " was detected in a test laboratory by an AP-360 CM device.



At the specified air pressure (5 mm. water.ust) the amount of air (sm³/cm³/s) passed through the tissue surface (1m²) per unit Time (s) is determined by the following formula:

$$B_{\Delta P} = \frac{V}{S\tau}$$

Here V is the air volume, sm³; S - tissue surface , sm²; t time, sec.

The air flow passes through the pores of the textile material, therefore, the air permeability indicators depend on the structural properties of the material, which determine its porosity, the number and size of pores. The air permeability of the fabric decreases with increasing thickness of the fabric. The air permeability of the fabric is also affected by the number, size and type of processing of the pores on its surface, the number of layers of the fabric and the number of layers of the fabric.

In conclusion, having determined the air permeability of samples of bag filters used in flour enterprises, it is recommended to produce these bag filters in woven form and to set the air permeability of these bag filters to 2.51 sm³/sm²s.

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