

## Comparative evaluation of methods for determining the resistance of materials to penetration of microbial suspensions

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**Keywords:** nonwovens, methods for determining resistance to penetration, microbial suspensions.

### Abstract

A comparative assessment of the currently used methods for determining the resistance of materials to the penetration of microbial suspensions is carried out. The essence of the analyzed methods consists in comparing the number of colonies of microorganisms grown through the test sample with the number of colonies of microorganisms grown on control samples.

To standardize the materials, the method GOST standard 12.4.136-84 of 04/01/1990, of 01/04/1990 "Occupational safety standards system. Personal protective equipment, a method for determining the permeability of microorganisms", establish a protection class; method ISO 22610: 2006 (R) "Surgical sheets, gowns and suits for clean rooms for patients, medical personnel and equipment used as medical devices, test method for determining the resistance to penetration of wet bacterial environments" determines the total penetration coefficient indicated in addition to the usual labeling of medical materials, and may be the interest for products to enter the international market. The methods described by researchers Ransjo U., Hambraeus A., Blom A.W., Estela C.M., Bowker K.E., MacGowan A.P., Hardy J., take place in laboratory tests for comparative studies.

As a test culture was used *Bacillus subtilis*. Nonwovens were analyzed: three-layer Medicase RKV, Belgium and Softess Dupon, USA. The results of assessing the permeability of materials by the microbial suspension of *Bacillus subtilis*, obtained by various methods, correlate with each other. Medicase RKV was found to have poor barrier properties and is not resistant to microbial entry. The material Softess Dupon has good barrier properties and is relatively resistant to the penetration of microorganisms: it has a 5th grade of protection, a bacterial threat of T – 60, a coefficient of penetration through the barrier of Cvp – 0.75, a bacterial index lv – 5.67, characterized by meager growth of microorganisms upon contact of the material with bacteria for 15, 30, 60 minutes and excessive growth – upon contact for 90 minutes.

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