

# **Standard Filters for Assessment of Repeatability of Test Stands for Testing Penetration of Filtering Materials Against Solid and Liquid Aerosols**

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The primary aim of this study was to develop a standard filter to assess the repeatability of test stands used for testing penetration of filtering materials against solid and liquid aerosols. The non-steady state of filtration was analyzed for several different filtering materials and constructions of filters. The correlation between filter structure and aerosol penetration was found, analyzed and described in a way that it makes possible to design filters with desired penetration characteristics. The tests of designed prototypes were performed with the use of two standard aerosols: sodium chloride and paraffin oil mist. As the result of the research a standard filter was developed that is characterized by the following parameters: constant penetration in time when filter is being loaded during tests; airflow resistance on the level of P2 filters for respiratory protection; the size distribution of aerosols does not change when aerosols pass through the filter. Moreover, the electrostatic charge of aerosols does not affect the filter's penetration. The developed standard filter is resistant to mechanical and thermal factors as well.

There is also possibility of making required number of filters of known aerosol penetration for different levels of filtration efficiency (for example: P1, P2, P3).