

**INTER-LABORATORY VALIDATION OF THE METHOD TO DETERMINE THE
FILTRATION EFFICIENCY FOR AIRBORNE PARTICLES IN THE 3–500 NM
RANGE AND RESULTS SENSITIVITY ANALYSIS**

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The filtration of airborne nanoparticles is becoming an important issue as they are produced in large quantities from material synthesis and combustion emission. Current international standards dealing with efficiency test for filters and filter media focus on measurement of the minimum efficiency at the most penetrating particle size. The available knowledge and instruments provide a solid base for development of test methods to determine the effectiveness of filtration media for airborne nanoparticles down to a single-digit nanometer range.

An inter-laboratory evaluation is performed under the Technical Committee 195 of European Committee for Standardization (CEN/TC195) for the development of the methodology to determine effectiveness of filtration media for airborne particles in the 3–500 nm range. Statistical analysis of the results was performed according to ISO 5725-2 in order to evaluate the test procedure and sensitivity analysis was carried out to identify the factors that could possibly affect the test results.

Inter-laboratory analysis revealed some deviation among the experimental results. The statistical analysis showed a less than 20% deviation. This deviation could be attributed to the difference among the experimental setups used by the laboratories. The sensitivity analyses did not indicate a strong influence by the temperature, relative humidity, flow distribution, challenging particle concentration, or particle density on the filtration efficiency in the parameter ranges used in the inter-laboratory test. However, the charging status of the filter affected the filtration efficiency.