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INTERLABORATORY COMPARISON TO EVALUATE THE METHODOLOGY FOR DETERMINATION OF THE MEDIA FILTRATION EFFICIENCY AGAINST NANOPARTICLES

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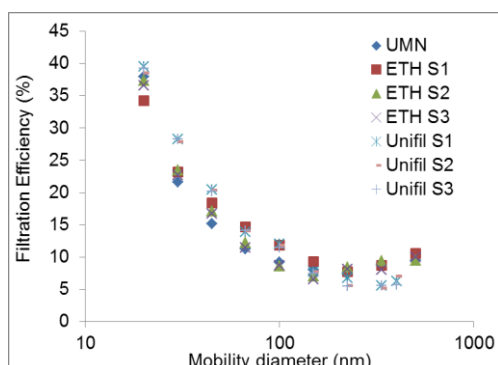
ABSTRACT

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 against airborne nanoparticles down to single-digit nanometer range.

An interlaboratory evaluation is performed in the framework of the European Mandate M/461 activities, within the Technical Committee 195 of European Committee for Standardization (CEN/TC195). The purpose is to develop a methodology to determine effectiveness of filtration media against air-borne particles in the 3 – 500 nm range.

Five different laboratories (Camfil, ETH/Empa, Politecnico di Torino, University of Minnesota, Unifil) participate in the round robin test in order to verify the repeatability and reproducibility of the test method. The qualification of test rig and apparatus is performed prior of the filtration efficiency and air flow resistance measurement tests.

Twilled dutch weave wire mesh was chosen to perform the filtration efficiency tests so as to ensure high uniformity of the samples being tested by each different laboratory. Some preliminary results are presented in the figure below. The filtration efficiency results of three laboratories are in accordance with each other, which may be an indication that there is a good repeatability and reproducibility.



The figure on the left shows some filtration efficiency data referring to different wire mesh samples and laboratories. The data were measured at 5 cm/s face velocity.

Upon the completion of the round robin tests a statistical analysis under ISO 5725-2, will be performed in order to evaluate the accuracy of the methodology.

KEYWORDS

Filtration Performance, Nanofiltration, Filter Media, Filter Test, Standard Methods, Test rig