MEASURING PM2.5 FOR CLEANABLE FILTER MEDIA IN ISO 11057 OR ASTM D6830 TESTS USING AN OPTICAL AEROSOL SPECTROMETER PROMO LED

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Cleanable filter media for pulse-jet cleaned filters are tested for operational performance and for particulate emission, where the focus shifts more and more towards particles smaller 2.5 µm. The measured data include generally the total dust concentration in the clean gas as an average over a defined number of filtration cycles and also, as an option, the determination of PM2.5 emission.
For high performance filter media which show very little particle emission, the gravimetric determination of the PM2.5 values becomes very time consuming and results in measurements of six or more hours, when using an impactor or cyclone.

Optical Aerosol Spectrometers are increasingly used in environmental PM2.5 measurements and are also certified by authorities. These instruments offer a viable and very fast method to also determine total dust concentration and PM2.5-values in the laboratory using a specified test dust under defined conditions. A further advantage besides the time saving potential is the very good time resolution and fast measurements of particle size distributions at every stage of the testing.
In this presentation a fast and easy method is introduced to determine PM2.5 emission optically instead of gravimetrically, using an Aerosol Spectrometer Promo LED with a measuring range from 150 nm to 10 µm. Test results gained on an ISO11057 reference filter test rig show the feasibility of the method, the accuracy of the gravimetric values and the potential for saving of measuring time.