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AEROSOL SEPARATION BY FILTERING DEVICES

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Aerosols, especially those particle fractions below 10 and 2.5 microns can cause serious heart and respiratory diseases and effective pollutant standards and methods for their reduction are stringently required. Therefore, stricter emission European Union regulations were recently established in order to improve the fine dust situation of the ambient air in Europe. Details to the regulations are given in the paper.

Among the existing technical separation devices the filtering dust separator is the most suitable one to meet very low dust emission concentrations of industrial exhaust gases. But the disadvantage of this separator is the relative high pressure drop and sometimes premature filter media clogging which requires its costly replacement. Therefore, suitable design methods should be developed to minimize this problem.

Concerning the value of the raw gas concentration, two different kinds of filtering separators are in use; for low concentrations depth filters and for high concentrations cleanable filters. Cleanable filters can be applied not only for solid (dust) particles, but also for high droplet raw gas concentrations. For the latter, the cleaned-off liquid droplets are running out as a drainage flow. In order to optimally design cleanable filters, suitable design and standard laboratory test methods are under development. In this work the state of the current development for standard cleanable dust filter testing (VDI3926, ISO/CD 11057) and new results concerning the filter medium aging (Figure 1), which is part of the standard test procedure, will be presented. Reflecting a comparison of cleanable dust filters with cleanable droplet filters, the latter also requires an aging procedure and a suitable separation efficiency measurement, new methods for standard testing for droplet filters will be presented (Figure 2).
Figure 1: Aging test at an aging chamber /1/.

Figure 2: Standard test equipment for cleanable droplet filters /2/.
