

S3.1.1 FILTER LOADING CHARACTERISTICS OF DIFFERENT NANOFIBER COATED FILTER MEDIA AGAINST DUST AND OIL MIXTURE

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Recent years have seen frequent high PM_{2.5} pollutions in China and other Asian countries. It's widely believed that vehicle emission contributes an important part in PM_{2.5} pollutions. Besides exhaust emission, it's estimated that about 25% hydrocarbon pollutants of gasoline car are from fuel evaporation and crankcase emission in China. These unburn hydrocarbon are mainly liquid oil and can suspend together with solid particles in the air. The mixture of solid and oil can have an adverse impact on the lifetime of filter, which has already been reported in several cases in Beijing gas turbine power plants with shorter filter life. The current air filter standards only use solid particles to evaluate the load characteristics, and fail to reveal the filtration performance when filters are challenged by solid and oil mixture. This study assessed the loading characteristics of four filter media against A2 fine dust and DEHS mixture. Three of the filter media were nanofiber coated by electrospinning, melt-blowing and wet-laid multilayer method, respectively. One conventional high-efficiency media without nanofiber layer was compared. It's found that the ratio of dust and oil played a key role in the loading performance. Different nanofiber coating technology were compared, and a new idea of filter media considering the dust and oil loading was proposed.