

The Effect of the Layer Structure on Filtration Performance of the Depth Filter Media for Gas Turbine Intake Air Filtration

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Depth filter media are characterized by the multiple layer structure. There are three main parameters which indicate the filtration performance of the filter media. The arrangement of the filter media layers is of crucial importance. Upstream layer is made of more open fibrous structure and as such is suitable for collecting the gross particles. The supporting layer is made of even more open structure and is intended for the stability of the filter media. The downstream layer as final layer of the filter media influences the particle collection efficiency and the initial pressure drop since this layer has more dense packing structure than the upstream and supporting layer. Fine particles are capture by the final layer. Two types of each upstream and downstream layer were manufactured while keeping the same type of the supporting layer. The filtration performance of these media was closely observed by testing the filter cartridges with the same pleat count and cartridge dimensions. By varying the layer structure of the filter media, differences are visible in the pressure drop pattern especially for the variation of the upstream layer. The effect of the final layer is noticeable for the particle collection efficiency especially at the initial stage short time after the begin of loading the filter with test dust.