

Effect of nonwoven drainage channels on the performance of coalescing filters

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Abstract

In many industrial sectors fibrous filters are used to remove undesirable particles from gas streams. Liquid aerosol filtration is one of techniques used to remove particles and drops from air streams. The many applications include industrial dehumidification, cabin air filtration, and automobile exhaust filtration. Aerosol filtration is important for health and safety of people and for environmental protection.

In coalescence filtration when the droplets are captured onto the fibers the liquid saturation inside the filter medium increases which causes an increase in the pressure drop and hence decreases the quality factor. Incorporating drainage channels in the filter medium can help reduce the saturation inside the filter medium by allowing the liquid to more easily drain from the filter medium. The large coalesced drops can be drained from the filter media through the larger pores of the drainage channels and open up the void space inside the filter medium for gas flow. Experimental results show that the filter media equipped with drainage channel has lower saturation and improved quality factor as compared to a filter media without drainage channel.

Key Words: Aerosol, gravity

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