

The influence of pleat geometry on initial pressure drop of air filters - simulations

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ABSTRACT

Geometric factors such as pleat space, pleat depth, and pleat shape have a big impact on initial pressure drop of a pleated air filter. The air flow through a model pleat has been simulated for a wide range of parameters to predict the optimum geometry for minimal pressure drop. The results were compared to predictions of basic theoretical formulas.

Further, the pleat shape can greatly effect the distribution of filter face velocity in the pleat. Using common models for fractional efficiency found in the literature, it is shown that optimum pleat geometry for initial pressure drop can differ from optimum geometry for highest filter quality factor regarding MPPS particles.

BIOGRAPHY, SHORT SKETCH

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Bio

Philipp Hettkamp holds a MSc in physics (University of Bonn, Germany) and is currently working towards a PhD in the gas-particle-systems group at the Karlsruhe Institute of Technology. His research interests lie in dust loading kinetics of air filters. Before this he worked in the field of air cleaning / electrostatic precipitation at KMA Filter in Königswinter, Germany.