

Abstract Submitted  
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**Effects of Microstructural Parameters on Permeability of Fibrous Materials to Non-Newtonian Fluids** B. EMAMI, H. VAHEDI TAFRESHI, Virginia Commonwealth University — In this work, a series of numerical simulations has been devised to relate the non-Newtonian permeability constant of a fibrous medium to its Newtonian counterpart. Developing virtual 3-D geometries that resemble the internal microstructure of a fibrous material, we studied the effects of fiber diameter, fiber in-plane and through-plane orientations, and media's porosity on the media's permeability to Non-Newtonian fluids such as blood. The results of our digital experiments are used in conjunction with available analytical relations, derived to predict the non-Newtonian permeability constants of granular beds, to develop new empirical correlations for fibrous materials.

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