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FORMATION OF SHAPED/MOLDED MELTBLOWING NONWOVEN STRUCTURES

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ABSTRACT

Three dimensional (3D) fiberweb structures are useful in many applications. The Robotic Fiber Assembly and Control System (RFACS) being developed in this research allows precise control of fiber meltblown fiber deposition on a 3D mold surface. The effect of various process parameters on a number of polypropylene (PP) web characteristics is reported. Under the experimental range studied, the fiber orientation distribution was significantly impacted by the process parameters. The fiber diameter distributions indicate that they are unique to a particular process condition. The distributions do not overlap when a parameter is evaluated. In keeping with the long-term objective of developing chemical/biological barrier fabrics using RFACS technology, the pore distribution of the fiberwebs was characterized. Under the conditions explored, the average pore size of the analyzing web has decreased by 60% when the attenuating air pressure was increased from 0.7 bar to 2.8 bar. The pore size was decreased by 33% when the take up speed of the web was increased from 20 ft/min to 50 ft/min.