

PP1.3.2 Detachment of Liquid Droplets from Junctions of Crossing Fibers Exposed to Air Flow

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A number of previous studies have focused on the movements of droplets along a fiber; however, more detailed studies need to be carried out to better understand the behavior and the mechanism of the movement of these droplets when encountering a junction of fibers which is inevitable in real examples of fibrous media. This work presents the results of a microscopic study of liquid droplets detachments from junctions of crossed fibers when subjected to air flow. The crossed fibers were adjusted to create different angles, within a plane, relative to the airflow direction. These simple combinations of angles of fibers are the basic fiber orientations in a complex fibrous filter structure. The liquid droplets were placed on the intersection point using a syringe method. A correlation was developed for the minimum Reynolds number of gas at which the drops began to move. This correlation allows us to predict the gas flow conditions required to detach the drops from the fiber junction.

