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S2.4: Residential Filtration for Controlling Bioaerosols

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ABSTRACT

Indoor air pollutants including bioaerosols are among one of the environmental health risks. Exposure to bioaerosols is associated with a wide range of potential health effects including infectious diseases, allergies and others. The indoor concentration of bioaerosols can be reduced by properly designed, installed and maintained HVAC systems, as well as portable air cleaners.

The effectiveness of a specific filtration device in reducing concentration of particulate matter inside residential houses depends on the filtration efficiency of the device, the amount of air handled by the device, amount of air by-pass, and other factors. Some air cleaning devices are installed in the ductwork of residential HVAC systems to clean air in the entire house, and some systems, such as portable air cleaners, are used to clean air in a single room or specific area.

In this study, the results of an in-situ experimental evaluation of residential furnace filters and portable air cleaners in the test house are presented. Several filters with filtration efficiency ranging from MERV8 to MERV 13 were selected for this experiment. Results are presented as a decay of particle concentration of specific sizes. Particle size of 0.8 and 3.5 µm are used for predicting the removal efficiency for typical indoor bioaerosols.