



FALL VIRTUAL CONFERENCE

S1.7: A Study of Viral Filtration Performance of Residential HVAC Filters

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ABSTRACT

An experimental study was carried out to investigate the efficacy and effectiveness of residential HVAC filters at removing airborne virus particles. MS-2 bacteriophage organisms were grown on appropriate media, harvested, resuspended in saline, and then aerosolized into the ASHRAE 52.2 test duct using a nebulizer. Upstream and downstream air samples were taken using SKC BioStage cascade impactors. The collection plates were incubated and the recovered plaque-forming units (PFU) were enumerated to determine the filtration efficiency of filters against virus particles. It was concluded that high efficiency residential HVAC (Heating Ventilation and Air-Conditioning) filters were effective at capturing airborne virus particles in the air passing through the filter. The viral filtration efficiency (VFE) was found to be generally correlated to its MERV rating, i.e. the higher the MERV, the higher VFE. MERV 13 and MERV 14 filters were found to capture 88% and 97% respectively virus particles in the air passing through the filter. It was also found that in comparison to initial E1, E2 and E3 efficiencies measured per ASHRAE 52.2, the viral filtration efficiency was higher than initial E1 efficiency, but lower than initial E2 and E3 efficiencies.