S1.3.4 - *High E1 Filter Media Using Nanofibers*

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There is an urgent need to utilize MERV 13 filters in commercial and residential HVAC systems. MERV 13 is the lowest efficiency rating with significant capture (50%) of small E1 (.3 um – 1 um) particles. Today, nonwoven filtration media are being used to manufacture MERV 13 filters. Unfortunately, this technology has glaring disadvantages, including an undesirable pressure drop that results in increased energy usage because of higher air resistance. Traditional filtration media with poor E1 capture does an adequate job of keeping the larger E3 (> 3 um) particles from damaging HVAC equipment, but they are inadequate at removing the very fine E1 respirable particles that have been known to lead to significant health problems. The recent pandemic involving COVID-19, which is carried by these small E1 particles, further substantiates the need to focus on E1 particle capture to improve overall indoor air quality and overall health. Previous research has indicated that nanofiber-enhanced substrates prevent numerous harmful particles from entering the body, thus stopping them from settling in the alveoli deep in the lungs and then being absorbed into the bloodstream. This study focuses on applying nanofiber technology to various base substrates to evaluate the effect on E1 capture and overall filtration performance. Results of this study have important implications for reducing debilitating health issues linked to poor indoor air quality.

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