

FACTORS AFFECTING PERFORMANCE OF AIR CLEANING SYSTEMS FOR PROTECTING RESIDENTIAL AND COMMERCIAL BUILDINGS

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ABSTRACT

Cleaning of indoor air is a valuable option for reducing building residents' exposure to indoor air pollutants. Commonly known pollutants are only part of array of indoor air contaminants affecting residents and buildings they occupy. The effect of hazardous air pollutants including CBR agents can be reduced by properly designed, installed and maintained HVAC systems as well as portable air cleaners.

This paper provides a general introduction to biological and chemical agents, and HVAC filters suitable for use in this arena. Additionally, portable air cleaners are discussed, since they can be employed to increase protection against air contaminants. Performance of current HVAC filters and filters for portable air cleaners as well as limitations of test methods for testing these filters are also discussed. In addition to the filter rated efficiency at specified flow rate, factors such as filter by-pass, flow distribution and filter performance degradation play a critical role in effective removal of airborne contaminant from indoor air.

All the above factors together with limitations of the current test methods represent the un-met expectations of filter users for protection against hazardous air pollutants, as well as the un-met needs for efficient air cleaning systems for commercial and residential buildings.