

S3.2.2 Impact of Residential HVAC Filters on Indoor Air Quality

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Indoor air quality is critical to the health of building residents. Room air contains gas contaminants such as formaldehyde, radon, volatile organic compounds; and particulates such as PM_{2.5}, dust, smoke, airborne allergens, bacteria and virus. Numerous researches and studies revealed that high levels of indoor air pollutants can cause adverse health effects. Many research studies have discovered that cardiovascular and lung cancer mortality were each positively associated with ambient PM_{2.5} concentrations. Reduced PM_{2.5} concentrations were associated with reduced mortality risk.

Filtration and ventilation are commonly used to remove or dilute airborne contaminants and improve indoor air quality. This study is concentrated on the effectiveness of residential HVAC filters for reducing air contaminants in residential buildings. To assess the efficacy of residential HVAC filters, efficiencies and pressure drops of filters of different MERV levels were first measured according to ASHRAE 52.2. Then an indoor air quality (IAQ) model was applied to characterize health-relevant indoor aerosols in different residences with various combinations of filter types and ventilation conditions. Modeling results will be discussed in the presentation.