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# Deposition of Fine Particles on Vertical Textile Surfaces: A Small-Scale Chamber Study

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## Abstract

Particle deposition on building internal surfaces has been extensively studied; however, common indoor textile surfaces have been rarely mentioned. Thus, the main goal of this study was to evaluate the effects of surface properties of textile materials on particle deposition. Two special surface analysis techniques were introduced to measure the surface roughness of textile materials. The deposition loss rate coefficients of different size of particles on vertically oriented textile surfaces were determined experimentally. A 512-L aluminum cubic experimental chamber (0.8 m × 0.8 m × 0.8 m) was built to measure the deposition loss rate coefficient of 0.37, 0.54, 0.75, 0.9, 1.3, and 1.6 μm particles under three airflow intensity levels. The deposition loss rate coefficients for eight single-layer curtain cloths with different surface roughness were measured. The results show that the deposition loss rate coefficient increased with the near-surface airflow velocity and exhibited a V-shaped distribution with the increase in particle size. The degree of influence on the particle deposition of textile surface roughness is related to the tightness of textile material, near-surface

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