

Rodes, C. E., J.R. Newsome, R. W. Vanderpool, J. T. Antley and R. G. Lewis. Experimental methodologies and preliminary transfer factor data for estimation of dermal exposures to particles. Journal of Exposure analysis and Environmental Epidemiology 11: 123-139 (2001).

ABSTRACT

Fluorescein tagged Arizona Test Dust was used as a possible surrogate for household dust. A computer controlled deposition chamber was used to produce uniform particle loadings on the test materials. Particle transfer efficiency for both wet and dry skin were measured. Test surfaces included stainless steel, vinyl, and carpeted surfaces that had been pre-loaded with the tagged dust. These experiments showed that only about 1/3 of the surface of a projected hand actually contacted a smooth test surface during a hand press. In addition, the fraction of particles transferred to the skin decreased as the surface roughness increased. The transfer coefficient for carpet averaged 7-10% that of stainless steel. Hand dampness increased the efficiency of particle transfer. Consecutive presses decreased particle transfer by a factor of 3 as the skin surface became loaded. As many as 100 presses were required to reach an equilibrium transfer rate. As the particle size decreased the metals concentration in house dust increased with 25 micron particles having two or more times the metals levels of 100 micron particles.