

Asbury, G. Cleaning and Foot Traffic Emissions Analysis. Test Number 0072198. Professional Testing Laboratory, Inc., Dalton, GA. unpublished data. 16 pages. May, 2002.

A series of experiments were conducted to determine airborne particulate (ISO Fine Test Dust 12103-1, A2) emissions during a variety of normal activities as a function of floor covering. Results were compared for hard and soft flooring surfaces. Surfaces were uniformly seeded with the standard test dust. Activities tested included: dust mopping a hard surface; vacuuming a standard carpet with a Carpet and Rug Institute (CRI) Green Label approved vacuum; vacuuming a standard carpet with a non-approved vacuum, walking on a hard surface and walking on a soft surface.

For the dust mopping experiment, the room was allowed to equilibrate (settle) for fourteen minutes. No airborne particles ($0.0 \text{ micrograms/meter}^3$) were detected. Dust mopping was begun at a walk rate average of 3.8 feet/second. At 30 seconds of dust mopping, the airborne particulate count rose to 46.2 micrograms. At 1 minute the airborne particulate counts increased to $353.9 \text{ micrograms/meter}^3$. The airborne particle counts rose steadily until at 11 minutes of mopping a peak concentration of $2032.9 \text{ micrograms/meter}^3$ was detected. The experiment was terminated at 12 minutes due to operator discomfort.

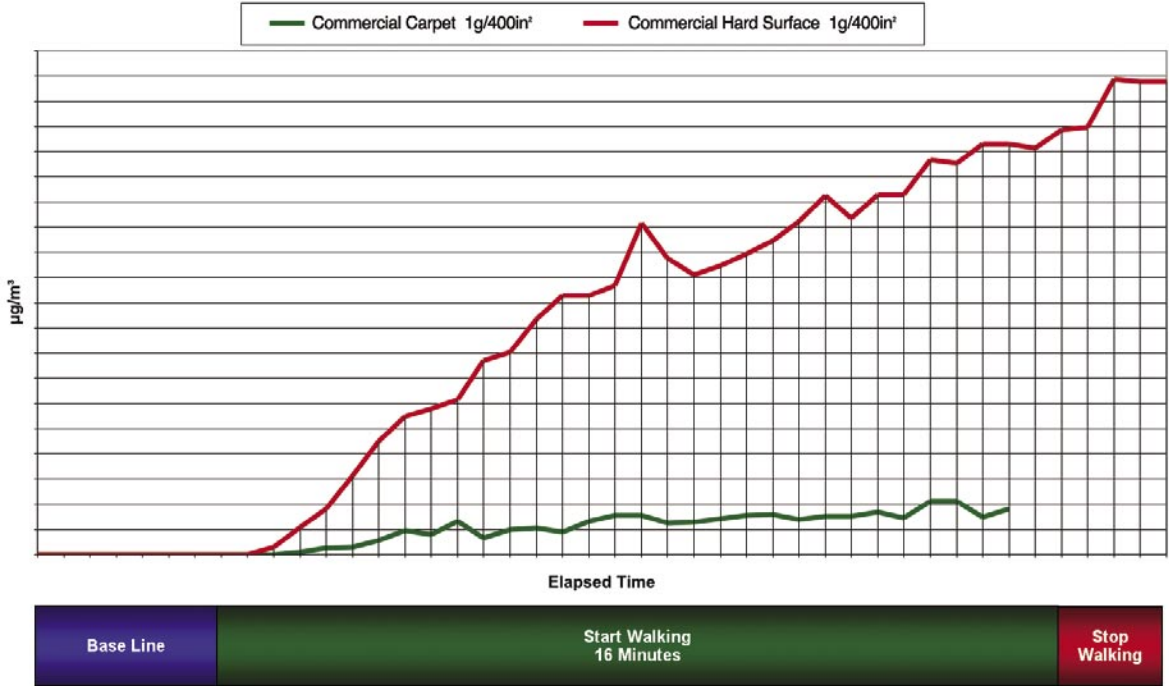
For the non-approved vacuum experiments, the room was allowed to equilibrate for 4 minutes. Airborne particle levels ranged between 0.4 and $0.8 \text{ micrograms/meter}^3$. The vacuum was energized in a stationary position over a dust seeded test carpet for 10 minutes. Airborne particle levels increased slowly from 1.0 to $6.3 \text{ micrograms/meter}^3$ over the 10 minute period. At this point, the vacuum was mobilized at a rate of 1.8 feet per second. Within ninety seconds, the airborne particle level rose to $463.3 \text{ micrograms/meter}^3$. The peak airborne level was reached 30 seconds later at $553.7 \text{ micrograms/meter}^3$. (Note: This is 15.6 times the peak level detected with the CRI approved Green Label vacuum tested. See below). Over the remaining 8 minutes of the experiment, the airborne particle levels declined to a final level of $156.1 \text{ micrograms/meter}^3$. The vacuum was deenergized and the particle level followed for 4 minutes. At the end of this period, the airborne particle level had fallen to a level of $136.0 \text{ micrograms/meter}^3$.

For the CRI Green label approved vacuum experiments, the room was again allowed to equilibrate for 4 minutes. Airborne particle levels ranged between 0.6 and $1.1 \text{ micrograms/meter}^3$. The vacuum was energized in a stationary position over a dust seeded test carpet for 10 minutes. Airborne particle levels increased slowly from 0.9 to $8.7 \text{ micrograms/meter}^3$. At this point the vacuum was mobilized at a rate of 1.8 feet per second. At 1 minute of operation a peak particle level of $35.4 \text{ micrograms/meter}^3$ was reached. Over the next 90 seconds, this level declined to $26.2 \text{ micrograms/meter}^3$. Over the rest of the 10 minute experiment, the airborne particle levels ranged between 25.9 and $21.9 \text{ micrograms/meter}^3$. The vacuum was deenergized and the particle level followed for 4 minutes. At the end of this period, the airborne particle level had fallen to a level of $18.9 \text{ micrograms/meter}^3$.

For the walking experiments, a similar protocol was followed. A standard hard surface or carpet was seeded with test dust. The test walker stood quietly for 4 minutes. In both hard and soft surface cases, the airborne particle levels were steady for the entire period at $0.0 \text{ micrograms/meter}^3$. On the hard surface floor, the test walker then began walking at a rate of 3.8 feet per second for 18 minutes. At 1 minute, the airborne level had risen to $15.1 \text{ micrograms/meter}^3$. At 2 minutes, the level was $91.3 \text{ micrograms/meter}^3$. The airborne particle levels rose steadily over course of the entire 18 minute walk. The peak concentration was $943.4 \text{ micrograms/meter}^3$ reached at 17 minutes. This level is 8.9 times the peak level seen on a carpeted surface.

For the carpet walking experiment, the airborne particle levels were steady for the entire 4 minute equilibration period at $0.0 \text{ micrograms/meter}^3$. When walking began, the particle levels increased to $7.8 \text{ micrograms/meter}^3$ at 30 seconds and $14.4 \text{ micrograms/meter}^3$ peak level of $105.6 \text{ micrograms/meter}^3$ was reached at 10 minutes of walking. (Note: this peak level was not minute walk the airborne particle level was $81 \text{ micrograms/meter}^3$).

Foot Traffic Emissions Analysis—Room Air Sampling



Room Air Sampling

