

## Occupational exposure to airborne asbestos from coatings, mastics, and adhesives

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Over the past few years, a question has arisen about the degree of exposure to airborne asbestos associated with the application, cleanup, and tear-out of glues and mastics used between 1940 and the present. These liquid products were used either to adhere insulation to pipes and boilers or to cover the insulation so as to protect it. In this study, four asbestos-containing products, a coating, two mastics, and an adhesive, which were representative of the various classes of products that have been used historically, were tested to determine the airborne concentration of asbestos fibers released during five different activities (application, spill cleanup, sanding, removal, and sweep cleaning). Each activity was performed for 30 min (often in triplicate). Personal ( $n = 172$ ) and area ( $n = 280$ ) air samples were collected during the tests, and each was analyzed for total fiber concentrations using phase contrast microscopy (PCM), and for asbestos fiber count using transmission electron microscopy (TEM). A measurable concentration of asbestos fibers was detected in six of the 452 samples collected (0.0017–0.0184 fibers/ml). The observed asbestos fibers counts for each product were similar to background. Only one asbestos fiber was detected in an indoor background sample; no asbestos fibers were identified in any of the outdoor background samples. The (raw) PCM-total fiber concentrations were adjusted based on TEM analyses that reported fraction of asbestos fibers (to derive a PCM-asbestos concentration) and by the fraction of the 8-h workday that a worker spends performing the activity (to derive a calculated TWA). For the coatings, mastics, and adhesives evaluated in the present study, the calculated TWAs using hypothetical work scenarios were well below the current Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL) of 0.1 fibers/ml. The calculated TWAs ranged from 0.03 to 0.009 fibers/ml. The actual concentration of airborne asbestos due to these products is almost certainly much less than the TWAs, and may be so low as to not be measurable. These results support the historical view that these products, over the past 50 years, did not pose an occupational health hazard under foreseeable uses.

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