

**WORKPLACE EXPOSURE ASSESSMENT
OF CELLULOSE INSULATION APPLICATORS**
R. E. McCleery
National Institute for Occupational Safety and Health
(NIOSH)
Cincinnati, OH

Abstract

NIOSH, through an interagency agreement with the National Institute of Environmental Health Sciences/National Toxicology Program, is engaged in an exposure assessment of cellulose insulation (CI) applicators. CI consists of shredded recycled newspapers with boric acid typically added as a fireproofing agent. Data are being collected, using 15 applicators from across the U.S., to characterize worker exposures to CI during activities including structure preparation, installation, and cleanup. Collected activity data include: atmospheric concentrations of total and respirable dust; dust characterization (fibers and/or particles) by scanning electron microscopy (SEM) including fiber count and sizing; and real-time particulate measurements with particle size discrimination.

Five of the fifteen site visits have been completed. Contractors' jobs vary according to site preparation, CI material used, dry or wet application, application technique, and application into new or existing, residential or commercial buildings. Air sampling data suggests that the extent of exposure can depend upon a number of the above factors. CI installation operations have resulted in overexposures to relevant 8-hour time-weighted average evaluation criteria and the American Conference of Governmental Industrial Hygienists (ACGIH) excursion limits for total dust. Installation of dry CI into attics revealed personal breathing zone (PBZ) total dust concentrations up to 430 mg/m³. A misting device in-line with the application hose moistened the CI and was found to significantly reduce the total dust concentration in the attic environment. Dumping bags of CI into the hopper revealed PBZ total dust concentrations up to 101 milligrams per cubic meter (mg/m³). Real-time particulate data with particle size distribution indicated that a majority of the airborne particles are in the nonrespirable range. SEM analysis has indicated an approximate 35/65 ratio of CI fibers to particulates. Average fiber lengths are approximately 55 micrometers. The use of respirators is recommended until effective engineering controls can be established.