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From: AndyObe@aol.com
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Subj: Asbestos Roadmap: NIOSH Docket Number NIOSH-099

The attached file has my comments on the draft document titled "Asbestos and Other Mineral Fibers: A Roadmap for Scientific Research."

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Asbestos and Other Mineral Fibers: A Roadmap for Scientific Research

Comments by Andrew F. Oberta, MPH, CIH
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General comment

The emphasis of the "Roadmap" is on the toxicity of asbestos and similar fibers, and their analysis by Phase Contrast Microscopy and Transmission Electron Microscopy. Respecting the "O" in NIOSH, the effort is directed at monitoring workers who are exposed to asbestos fibers.

However, as NIOSH methods 7400 and, to a lesser extent, 7402 are quite often used, "O" could also stand for "Occupants," "Outside" and "Other." Monitoring of manufacturing and abatement workers by PCM can readily be done with the existing 7400 method due to the sufficiently high fiber density normally obtained. It is when the method is used for different applications that problems arise.

Ambient, clearance and short-term samples barely approach the 100 f/mm² fiber minimum density for which NIOSH 7400 was validated. Even a well-run abatement project, particularly with non-friable ACM, may not exceed this threshold. Samples taken for OSHA Negative Exposure Assessments, in particular the 30-minute STEL samples, typically have fewer fibers than the limit of detection for NIOSH 7400. For this and the other applications mentioned, decisions must often be made on the basis of not what was found but inferences from what was not. The recently-released EPA Draft Report "Comparison of the Alternative Asbestos Control Method and the NESHAP Method for Demolition of Asbestos-Containing Buildings" is a good example of how complex statistical methods had to be used to explain data that included few tangible results in the form of fibers and structures that could actually be seen on the filters.

These problems need to be solved in the field by altering the sampling methods or in the lab by improving the analytical methods. The Roadmap doesn't seem to address either of these issues. NIOSH 7400 needs to provide better guidance for those who conduct air sampling at abatement sites, in and around buildings and facilities, during Operations and Maintenance work and in other situations where low fiber densities are a fact of life. Recognizing that TEM analysis has advantages over PCM for some applications, it is equally a fact of life that PCM is and will continue to be used extensively due to advantages of cost and convenience.

Specific comment

The Roadmap has a statement that brings up a concern I've had about using NIOSH 7400 and 7402. On page 16 it states "Particles with diameters less than about 0.25 μm cannot be counted using Method 7400 because they are below the resolution limits of the optical microscopes routinely used." The word "about" suggests that 0.25 μm is not an absolute visibility cut-off and that the ability to resolve a fiber will depend on the analyst and the microscope. More than one analyst has told me that if he can see a fiber he counts it, and 7400 doesn't ask the analyst to ignore fibers he thinks are less than 0.25 μm thick.

On the other hand, the counting rules for 7402 state:

(1) Count all particles with diameter greater than 0.25 μm that meet the definition of a fiber (aspect ratio 3:1, longer than 5 μm). Use the guideline of counting all fibers that would

have been counted under phase contrast light microscopy (Method 7400). Use higher magnification (10000X) to determine fiber dimensions and countability under the acceptance criteria.

This rule specifically requires one to measure the fibers and exclude those $<0.25\mu\text{m}$, even if they're identified as asbestos. The "guideline" for the 7402 analyst is the assumption that a 7400 analyst would not see fibers thinner than $0.25\mu\text{m}$, which may or may not be the case.

I think it is possible that a PCM count could actually report more asbestos fibers (particularly amphiboles, which will be more prevalent than non-asbestos among the very thin fibers) than a TEM count from the same filter, given the size restriction in the 7402 method. If this issue has never been studied, it would be appropriate for NIOSH to do so and to make any changes to 7400 and 7402 that are deemed advisable.

Submitted by:

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