Clarification Notice

NESHAP Requirement to Perform Point Counting to Quantify Asbestos Below 10%

Since the amendment to the NESHAP for asbestos (Federal Register, Volume 55, Number 224, November 20, 1990) there have been several questions regarding the interpretation of the point count rule. Also, several recommendations for improving the quantitative analysis of asbestos in bulk samples have been made. This clarification notice addresses these questions and discusses the recommendations. A discussion of important considerations related to the quantitative analysis of asbestos in bulk samples follows the clarification statements. This clarification applies to all regulated asbestos-containing materials as defined in 40 CFR Section 61.141.

First, a sample in which no asbestos is detected by polarized light microscopy (PLM) does not have to be point counted. However, a minimum of three slide mounts should be prepared and examined in their entirety by PLM to determine if asbestos is present. This process should be carefully documented by the laboratory.

Second, if the analyst detects asbestos in the sample and estimates the amount by visual estimation to be less than 10%, the owner or operator of the building may (1) elect to assume the amount to be greater than 1% and treat the material as asbestos-containing material, or (2) require verification of the amount by point counting.

Third, if a result obtained by point count is different from a result obtained by visual estimation, the point count result will be used.

Discussion

The recently amended NESAP for asbestos (Federal Register, V. 55, N. 224, 11/20/90) requires that when the asbestos content of a bulk material is determined using procedures outlined in the interim method (40 CFR Part 763, Appendix A to Subpart F), and the asbestos content is estimated to be less than 10% by a method other than point counting, the quantitative analysis must be repeated using the point count technique. This action was taken after several reports of data from split samples analyzed by visual estimation by two or more laboratories produced conflicting results which made it difficult to determine if a sample should be classified as an asbestos-containing material. The materials were re-analyzed by point count and by inter-laboratory exchange of prepared samples resulting in a consistent set of data. A review of data from performance audits indicated an unacceptable number of false negatives (reporting the sample as

containing less than 1% asbestos for asbestos-containing samples containing greater than 1% asbestos) and an unacceptable number of false positives (reporting the sample as containing greater than 1% asbestos for samples containing less than 1% asbestos).

The Office of Research and Development (EPA/ORD) informally interviewed laboratories to determine the cause of these errors and learned that: (1) some laboratories did not view a sufficient amount of the sample to detect asbestos when present or failed to properly identify the asbestos component, resulting in false negatives, and (2) some laboratories employed arbitrary rules for determining quantity, such as "one fiber detected is considered to be greater than 1%", resulting in false positives. Several round-robin studies and eighteen rounds of performance audit data indicate nearly all laboratories greatly overestimate the amount of asbestos using visual estimation techniques which are not related to standard materials of known composition. Because these false negatives and false positives result in either operations not being covered by NESHAP that should be or unnecessary expenditure of funds for abatement, respectively, the Agency believes that additional effort on the part of the laboratory is warranted.

It should be noted that samples in which no asbestos is detected during analysis by polarized light microscopy (PLM) do not have to be point counted. However, a minimum of three slide mounts should be prepared and examined in their entirety by PLM to determine if asbestos is present. Point counting will not improve the probability of detection of asbestos where no asbestos has been detected by PLM unless the analyst has only made a very cursory examination of the sample. In fact, the detection limit for the point counting method would be higher (less likelihood of detection) than that expected by visual estimation due to the fact that the only asbestos fibers counted are those that fall directly under the reticle index (cross line or point array), whereas (in theory) all fibers are observed during visual estimation.

When asbestos is observed to be above the laboratory blank level during PLM analysis, but less than 1% asbestos counts are recorded during point counting, the laboratory should report the sample contains trace asbestos. Also, false negatives that result from (1) misidentification of asbestos fibers as non-asbestos or (2) due to the inability of the microscopist to detect and confirm the presence of asbestos, will not be corrected by the point counting technique. Accurate results by point counting are obviously dependent on correct identification of fibers. A similar relationship is true for false positives, although it would be expected that point counting could improve quantitative results, given the pervasive tendency of laboratories to overestimate asbestos content, especially at the lower concentrations (less than 10%). However, the laboratory should take care to examine a sufficient amount of any sample to be sure that it does not contain asbestos. If the sample is not homogeneous, some homogenization procedure should be performed to ensure that slide preparations made from small pinch samples are representative of the total sample. A minimum of three slide mounts should be examined to determine the asbestos content by visual area estimation. Each slide should be scanned in its entirety and the relative proportions of asbestos to non-asbestos noted. It is suggested that the amount of asbestos compared to the amount of non-asbestos material

be recorded in several fields of each slide and the results be compared to data derived from the analysis of calibration materials having similar textures and asbestos content.

The parties legally responsible for a building (owner or operator) may take a conservative approach to being regulated by the asbestos NESHAP. The responsible party my choose to act as though the building material is an asbestos-containing material (greater than 1% asbestos) at any level of asbestos content (even less than 1% asbestos). Thus, if the analyst detects asbestos in the sample and estimates the amount to be less than 10% by visual estimation, the parties legally responsible (owner or operator) for the building may (1) elect to assume the amount to be greater than 1% and treat the material as regulated asbestos-containing material or (2) require verification of the amount by point counting.

The interim method states that asbestos shall be quantified using point counting or an equivalent estimation technique. The Agency (ORD) has been conducting research to determine procedures for defining "equivalent estimation." Recent studies have suggested that the use of gravimetrically prepared standard materials, in conjunction with quantitative techniques, can be used to improve the analyst's ability to estimate asbestos quantity. A procedure for the formulation of calibration materials and quality assurance (QA) procedures for their use has been drafted and is being tested. The Agency believes that use of such materials and QA procedures, as well as other objective measurement techniques, have the potential to greatly improve quantitative estimates of asbestos, especially in the range below 10%. If the research proves these procedures to be worthy, the Agency will consider proposing a revised method. A draft of the proposed procedure will be circulated to all NVLAP labs for comment when it has been approved internally.