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SCIENTIFIC LABS

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Transmission Electron Microscopy (TEM) is used to analyze samples which typically have fibers too thin to be observed by PLM. Air samples are typically analyzed for asbestos fibers following EPA (Level II and AHERA), NYSDOH ELAP and NIOSH (#7402) guidelines. Bulk building materials are analyzed by PLM, however TEM is often used to analyze difficult bulk materials (floor tiles, plaster, mastic, etc) for asbestos content following modified Chatfield, NYSDOH ELAP (#198.4) and EPA (#600/R-93/116) methods. TEM alone is used for analysis of water samples for asbestos following EPA (600/4-83-043 and 600/4-80-005) guidelines. The EPA drinking water method is referred to as the EPA 100.2 method. While debris samples may be analyzed by PLM, settled dust samples should be analyzed for by TEM using ASTM method 5755.

Settled Dust Evaluation (TEM) - Safe or "allowed" levels of asbestos in Settled Dust are not addressed by current legislation or mandated methodology. Settled dust evaluation is recommended by EPA documents such as the "Green Book" as a monitoring method for management programs. However, methods or "safe" levels are not addressed specifically. ASTM method D 5755 - 95 addresses microvac collection and TEM analysis of settled dust with results provided in structures per unit area of surface (again, no indication of health risks are addressed).

In common experience, it is found that surface concentrations over the ASTM D 5755 required LDL (lower detection limit) of 1,000 asbestos str/cm² are considered elevated. Subsequent cleaning by HEPA vacuuming and wet wiping commonly reduce measured dust levels to an order of magnitude below the LDL or sensitivity level.

Settled Dust - Descriptive Contamination Levels

<1,000. str/cm ²	<LDL
1-10,000. str/cm ²	Slight
10-100,000. str/cm ²	Moderate
100,000-1 Million. str/cm ²	Heavy
> 1 Million. str/cm ²	Extreme

1199 TRM

AHERA - "Interim Transmission Electron Microscopy Analytical Methods - Mandatory and Nonmandatory - and Mandatory Section to Determine Completion of Response Actions", Appendix A to Subpart E, 40 CFR part 763, October 30, 1987.

ASTM D5755-95 - "Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Fiber Concentration", American Society for Testing and Materials, 1916 Race St., Philadelphia, PA 19103.

EPA Level II - Yamato G. Agarwal SC, Gibbons RD, 1984 Methodology for the measurement of airborne asbestos by electron microscopy. Draft report. Washington, DC: Office of Toxic Substances, U.S. EPA. Contract No. 68-02-3266.

PLM - Perkins, R.L. And B.W. Harvey, "Method for the Determination of Asbestos in Bulk Building Materials", EPA/600/R-93/116.

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