



**Department of
Environmental
Protection**

59-17 Junction Boulevard
Flushing, New York
11373-5108

**Christopher O. Ward
Commissioner**

**Robert C. Avaltroni
Deputy Commissioner**

**Bureau of
Environmental
Compliance**

To: Commissioner Ward

From: Bob Avaltroni

Date: May 29, 2002

Subject: Asbestos Dust Sampling

Asbestos dust sampling using microvacuum and/or surface wipe techniques has been an issue of debate among industry experts and scientists for over a decade. The major issues for acceptance have been the lack of precision and the variability of results based on sampling collection methods and types of surfaces sampled.

On September 14, 2001, and subsequently on September 26, 2001, the Department released a memorandum to building owners indicating "Wipe sampling and/or microvacuum sampling are not recognized methods for asbestos sampling and should not be used". This position was taken early in the response action by the Asbestos Control Program in recognition of the controversial aspects of the sampling and the lack of standards for determination of contamination and cleanliness.

In 1995, the American Society for Testing and Materials (ASTM) issued a standard test method for microvacuum sampling for asbestos.

1. This method placed the burden on the user to determine the applicability of regulatory limitations prior to its use.
2. The standard test method specifically stated the collection efficiency was unknown and varied among substrates. The properties that influence collection efficiency included surface texture, adhesion, particle size distribution, etc.
3. The method specifically stated to "not sample any debris or dust particles greater than 1mm in diameter". This is due to the interference generated from particles greater than 1mm and is a significant drawback for sample collection.
4. The test method therefore required the collection of multiple independent samples from the same area. Quality control for analysis was based on reanalysis of the same samples due to difficulty in preparing quantitative asbestos samples.

The test method did not describe procedures or techniques required to evaluate the safety or habitability of buildings and did not set a standard or guidance for interpretation of the results. This method has not been adopted by any State or local regulatory agency.



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In 1999, the ASTM issued a standard test method for wipe sampling of surfaces. The limitations of this test method were similar to the limitations indicated for the microvacuum technique. This method also has not been adopted by any State or local regulatory agency.

A single direct relationship between asbestos-containing dust and potential human exposure has not been established. Although, a direct relationship between dust levels and exposure has been documented for other contaminants, including lead, this relationship has not been documented for asbestos fibers probably due to the unique aerodynamic aspects of asbestos fibers.

The scientific community is split on the use of a *k-factor* for evaluating the relationship between asbestos-containing dust and potential human exposure. The *k-factor* is expressed as the amount of asbestos in a volume of air divided by the amount of asbestos in the surface dust. The *k-factor* is a function of surface type, physical activity and the composition of the dust. The application of the *k-factor* to the response actions for the WTC is therefore questionable.

The circulation of air in conjunction with air sampling provides direct information on potential exposure. Asbestos is primarily an inhalation hazard that has been associated with lung cancer, mesothelioma, and asbestosis. The information is well established and is the basis for clearance air sampling in regulatory standards.

Clearance air monitoring following an asbestos removal project requires the use of forced air equipment to reentrain settled asbestos fiber and the collection of air samples during air circulation procedures. This methodology provides a direct evaluation of cleaning activities and has promulgated clearance criteria.

Individuals are trained and certified for collection of air and bulk samples. The training and certification requirements include units on hazard assessment, selection of sampling locations, and proper sample collection of air and bulk materials. Individuals are not uniformly trained or certified for collection of asbestos dust samples.

Further, conversations with the New York State Department of Health indicate that asbestos dust sampling and analysis procedures have not been adopted due to the lack of precision. Laboratories participating in the Environmental Laboratory Approval Program are not accredited to perform dust sample analysis. Reported results of dust sample analysis must indicate the laboratory is not accredited for the performance of the analysis.