



Asbestos - Microvacuum Sampling and Indirect Analysis of Dust by TEM

for Asbestos Structure Number Concentrations — ASTM D 5755

for Asbestos Mass Concentration— ASTM D 5756

ASTM Test Methods D 5755 and D 5756 describe procedures to collect and identify non-airborne asbestos concentrations in settled dust. Both methods provide estimates of the concentration of asbestos, but give the results in two different ways. ASTM D 5755 identifies the amount of asbestos fiber structures per 100 cm² while D 5756 indicates both the amount of asbestos per 100 cm² and the percentage of asbestos contained within the total dust sampled. Earlier sampling methods for non-airborne asbestos in dust required that a cut-out section of carpeting be sent to a laboratory for analysis. These ASTM methods utilize a “non-destructive” microvacuum technique to collect the samples.

Required Equipment:

1. An **air sampling pump** capable of sampling at the recommended flow rate with the sampling medium in line, such as:
 - SKC Universal Sampler
 - SKC AirChek® 2000 Sampler
 - SKC AirChek XR5000 Series Sampler
 - SKC AirChek 52 Sampler
2. An **air flow calibrator**, such as:
 - Defender Primary Standard Calibrator Cat. No. 717 Series
3. SKC **Microvacuum Cassette** for Microvacuum Sampling Cat. No. 225-322
4. **Disposable Wet Towels**
5. **Template** (10 cm x 10 cm) Cat. No. 225-2403

Optional Equipment:

1. SKC **Cassette Sealing Bands** Cat. No. 225-2503

SKC Application Guides:

1. Sampling Train—Filters, #1166
2. Calibrating a Pump Using an Electronic Flowmeter, #1366

	Sampling
Flow Rate	2000 ml/min
Sample Time	2 minutes minimum
Air Volume	varies*
Sample Type	Bulk Sample

* Bulk sample collected by microvacuum technique

Sampling and Analysis:

1. To set up a filter cassette sampling train for microvacuum sampling, use a microvacuum filter cassette, seal it with a sealing band (optional), remove the outlet plug, and connect the filter cassette outlet to the sampling pump inlet with the flexible tubing provided. Request SKC Application Guide #1166 for more information on preparing filter sampling trains.
2. For calibrating the pump, use the sampling train described above, remove the inlet plug from the microvacuum filter cassette inlet tubing nozzle, and connect the inlet tubing to the calibrator. Calibrate the

pump flow to the rate specified in the method. When calibration has been completed, detach the cassette inlet tubing from the calibrator and insert the inlet plug. Request SKC Application Guide #1366 for more information on calibrating a pump.

3. For sampling, set up a sampling train as above using a new microvacuum filter cassette (or construct one using a standard asbestos filter cassette and one inch of flexible tubing). The tubing nozzle from the inlet will act as a “vacuum cleaner” during sampling. To sample, remove the inlet plug from the tubing nozzle and follow the steps in item 4.

4. Measure a sample area of 100 cm² and vacuum for a minimum of two minutes until there is no visible surface dust remaining. Vacuum using orthogonal passes: vacuum first in one direction, then in a direction 90 degrees from the first. Avoid touching the surface with the tubing nozzle. Smaller or larger areas may be sampled as needed; for example, some areas may have a surface area less than 100 cm² or less dusty surfaces may require vacuuming of larger areas. Overloading the filter in microvacuum sampling is not a problem as in air sampling methods.

5. At the end of the sampling period, invert the cassette so that the nozzle faces up, turn off the pump, and note the ending time. Remove the filter cassette, cap the nozzle and the outlet of the cassette with the plugs provided, and record any pertinent sampling information and sampling locations.

6. Wipe the exterior of the cassette with disposable wet towels prior to packaging.

7. Submit field blanks from the same lot number as the sample filters. Field blanks should be subjected to exactly the same handling as the samples (seal and transport) except that no air is drawn through them.

8. Pack sample filters, field blanks, and all pertinent information securely for shipment to a laboratory for analysis.

Analyzing Method:

Transmission electron microscopy (TEM)

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