Asbestos in Settled Dust Sampling Instructions

Asbestos contamination may be found in dust from a variety of sources. The asbestos may be present due to a poorly performed remediation in the past or from decaying building materials, but regardless of the cause asbestos in dust can be a major source for concern. The asbestos found in dust generally presents itself in very small unbound fibers, which can be released into the air when the dust is disturbed. An alternative for dust sampling may be aggressive air testing which is not always a practical solution.

There are two commonly used ASTM methods available for sampling settled dust for asbestos analysis: ASTM D5755 (Micro-vacuum Method) and ASTM D6480 (Wipe Method). These methods are used to sample and analyze settled dust from a given area.

Notes:

- It is important to note that TEM is the only worthwhile choice for analysis, PLM is not an appropriate analytical approach.
- TEM filtration can provide a presence/absence on either of the stated sampling techniques while this is not EMSL's recommended analytical choice it can be a useful tool when you are unable to measure the area sampled, or you are using the qualitative result as confirmation of a suspected positive result.
- Sampling media is crucial for proper analysis, fiber interferences will occur if using improper media. Use of baby wipes, paper towels or tape would severely impact the ability to provide acceptable results.
- While these ASTM methods have been used in the asbestos industry for years there is no set action level. There are some industry accepted levels for concern as well as other sampling comparisons techniques (inside work area compared to outside) that are used.
- Results are provided in structures per square centimeter (Str/cm^2) regardless of the unit of measure used to sample.
- These methods are designed for dust; dust is different from debris. If you believe that your sampling area consists of debris, please contact the lab for alternative analysis options.

The summaries of both methods are relatively similar. The sampled dust is introduced into an aqueous solution of a known volume. The aqueous solution is then portioned into aliquots and filtered on to membrane filters. A subsection of the filter is collapsed on to a TEM grid. The samples are then analyzed via TEM wherein structures are counted, measured, and identified using SAED and EDXA at a significant magnification. The methods were designed for a sampling area of 100cm^2; however, a smaller area can be sampled for a location with heavy dust accumulation, or for a location with extremely light dust a larger area can be sampled. Ideally, a location with visible dust should be sampled, but not a location where the dust has formed an opaque layer. It is important to always provide the sampling area sizes on the chain of custody as they are used in calculations.

ASTM D6480 (Wipe Method)

Pro: Ability to sample hard to access areas with cumbersome equipment
Cons: The wipes will not work well on grooved, pitted or rough surfaces
When should the method be used: It works best on smooth, flat surfaces but can be utilized on a variety of surfaces if care is taken not to damage wipe. It is beneficial when there is no sampling pump available. Wipes are portable (sampling can been done "on the go" and without much set-up) and easily used in areas where pumps might be awkward to handle.

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Materials Needed

- Chain of Custody – Sample Information Form
- Clean room (fiber free) wipe available from EMSL Analytical Inc.
- 10cm x 10cm template (optional)
- Disposable gloves
- Duct tape or masking tape
- EMSL does have a kit available to order: Product ID# 8708202A (kit does not include tape)

Sampling Instructions

1. Place a 10cm x 10cm template on the surface to be sampled.
2. Secure template to the area to be wiped by taping the outside corners with masking or duct tape.
3. Put on disposable rubber gloves and remove the wetted wipe from the supplied tube.
4. *First Wiping (side to side)*
    a. Hold one edge of the wipe between the thumb and forefinger, draping the wipe over the fingers of a gloved hand.
    b. Hold fingers together, hand flat and wipe the selected surface area, starting at either corner furthest away from the operator (referred to as a far corner), and use a slow side to side (left to right or right to left) sweeping motion.
    c. During wiping, apply even pressure to the fingertips.
    d. At the end of the first side to side pass, turn the wipe's leading edge (portion of the wipe touching the surface) 180°.
    e. Pull the wipe path slightly close to the operator and make a second side to side pass in the reverse direction, slightly overlapping the first pass. The 180° turn is used to ensure that the wiping motion is always performed in the same direction on the wipe to maximize sample pickup.
    f. Continue to cover the sampling area within the template, using the slightly overlapping side to side passes with the 180° turns at each edge until the close corner of the template is reached.
    g. Carefully lift the sampled material into the wipe, using a slight rolling motion of the hand to capture the sample inside the wipe.
    h. Fold the wipe in half with the sample folded inside the fold.
5. *Second Wiping (top to bottom)*
    a. Using a clean side of the wipe, perform a second wiping over the sampling area within the template.
    b. Starting from a far corner in the same manner used for the first wiping, except use a top to bottom sweeping of the surface.
    c. When the close corner of the template is reached, carefully lift the sampled material into the wipe using a slight rolling motion of the hand to capture the sample inside the wipe.
    d. Fold the wipe in half again, with the sample from this second wiping folded inside the fold.
6. *Third Wiping (clean corners)*
    a. Using a clean side of the wipe, perform a third wiping around the perimeter of the sampling area within the template.
    b. Start from one edge of the template and use the same wiping technique as described above.

c. When the interior perimeter has been wiped and the starting location reached, carefully lift the sampled material into the wipe, using a slight rolling motion of the hand to capture the sample inside the wipe.

d. Fold the wipe in half one more time, with the sample from this third wiping folded inside the fold.

7. Insert the folded wipe back into the sample tube and replace cap.
8. Label the tube with sample number and any other information to uniquely identify the sample.
9. Insert sample tube into zip lock bag and seal.
10. Remove and discard gloves
11. Fill out the Chain of Custody – Sample Information Form as completely as possible. Include the sampler's name, address, project identification, and the date the results are needed. This form MUST accompany the samples to the lab.

Important Sampling Note: It is not always possible to sample a 10cm by 10cm area. In these cases simply discard the 10cm x 10cm template. The main thing is that the exact area sampled is documented on the Chain of Custody – Sample Information Sheet. Duct tape or masking tape can be used to define the sampling area.

ASTM D5755 (Micro-Vacuum Method)

Pro: Works well on all surface types
Cons: Sampling pump and cassette needed
When should the method be used: Micro-vacuum sampling works best for irregular, grooved or pitted surfaces.

Materials Needed

- Chain of Custody-Sample Information Form
- Cassette: 25mm or 37mm with MCE or PC filter membrane of <0.8micron pore size
- 10cm x 10cm template (optional)
- Duct tape or masking tape
- Tygon Tubing (approx. 25mm long) to attach to inlet of cassette
- Sampling pump (flow setting approx. 2LPM)
- EMSL does have a kit available to order: product # 8715314 (kit does not include tape or pump)

Sampling Instructions

1. Place a 10cm x 10cm template on the surface to be sampled.
2. Secure template to the area to be micro-vacuumed by taping the outside corners with masking or duct tape.
3. Cassette needs to be set-up with a length of tube on the inlet side to use as a nozzle (it is suggested to cut an approx. 45° angled tip for ease of use/ aids in vacuuming). The EMSL kit comes with a cassette with an inlet port that has a 45° angled tip designed for using as a nozzle.
4. Attach outlet side of cassette set-up to sampling pump (flow setting at approx. 2LPM)
5. Vacuum designated area until no visible dust or particulate remains. Run a minimum of 2 passes over entire area of interest for at least 2 minutes.

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6. Avoid dust or debris greater than 1mm in size.
7. Size of area vacuumed can be adjusted to suit circumstances. If a location has heavy dust settled, a smaller area may be sufficient. A low dust location may need a sampling area greater than 100cm^2. Similarly, if the only uncleaned areas are window sills then measurements may need to be taken, a 10cm X 10cm area may not always be available and a sampler may need to work with what is available, etc.
8. At the completion of sampling, flip the cassette so that the inlet faces upwards prior to turning off the pump. This is to ensure that the dust does not fall back out of nozzle/cassette.
9. The nozzle can handled in a few different ways: The nozzle can be sealed with cassette end-plug and then taped in place to prevent nozzle and cassette from separating, or remove nozzle (place plugs on both ends, plug inlet of cassette with end-plug and place both in a zip lock bag), or thirdly, remove nozzle and place inside of cassette. Nozzles are always kept and rinsed during prep.
10. Verify all samples are properly labeled. Wipe down (with disposable wet wipes) all exterior surfaces of cassettes during the preparation for shipping. Include an unused cassette and nozzle as a field blank.
11. Fill out the Chain of Custody – Sample Information Form as completely as possible. Include the sampler's name, address, project identification, and the date the results are needed. This form MUST accompany the samples to the lab.