



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
SOLID WASTE AND EMERGENCY  
RESPONSE

**MEMORANDUM**

**DATE:** July 3, 2002

**SUBJECT: 1. UPDATED LIST -- LABS FOR EPA'S  
ULTRASONICATION TEST FOR CARPETS**

**2. EPA WILL TRY TO REVERSE EARLY STUDIES  
SHOWING HEPA VACUUMS INEFFECTIVE**

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**TO:** Affected Parties and Responsible Officials

This memorandum lists additional laboratories known<sup>1</sup> to offer EPA's ultrasonication test for dust in carpets and woven fabrics.<sup>2</sup> This state-of-the-art test gives results as the number of asbestos structures per square centimeter (s/cm<sup>2</sup>). The results can then be related to background levels and safety guidelines. A major advantage in this test is that you do not need a consultant or industrial hygienist to take samples. The lab cost for an ultrasonication test (\$120 - \$300) is not substantially more than for a microvacuum test (around \$150), which would require an additional consultant fee.

This memorandum is an addendum to my 6/9/02 memorandum "Carpets, the Asbestos Reservoir" which discusses the ultrasonication method in greater detail. It is posted at the New York Environmental Law and Justice web site at [www.NYenviroLAW.org](http://www.NYenviroLAW.org).

As discussed later, EPA announced that they would be testing the effectiveness of HEPA vacuuming for removing asbestos from WTC fallout. However, EPA is only going to test the carpet after vacuuming with a microvacuum sampler. EPA apparently wants to justify its flawed cleanup method and reverse the results of its own earlier studies, which used the sonication extraction method to evaluate the effectiveness of HEPA vacuums.

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\* The conclusions and opinions in this memorandum are those of the author and do not necessarily reflect those of the U.S. Environmental Protection Agency.

**LABORATORIES OFFERING EPA's ULTRASONICATION TESTING OF CARPETS<sup>3</sup>****Method Number EPA 600/J-93/167 – Labs which have responded as of 7/1/02**

COSTS are for individual samples, which in almost all cases must be pre-paid (such as by credit card). Discounts may be available for larger volumes of samples as well as for clients with contracts. Costs may change.

Asbestos TEM Laboratories, Inc., 1409 Fifth Street, Suite C, Berkeley, CA 94710, Contact: Sean Fitzgerald, Phone: 510-528-0108, Fax: 510-528-0109, E-Mail: <a href="mailto:atem@sbcglobal.net">atem@sbcglobal.net</a>	\$120 for 6 -10 day, \$140 for 3 - 5 day, \$170 for 48 hr, \$190 for 24 hr., and \$300 for same day turnaround
ATC Associates Inc., 104 E. 25th Street 10th Floor, New York, NY 10010, Contact: Ms. Milena Lowd, Phone: 212-353-8280 x247, Fax: 212-353-3599, E-Mail: <a href="mailto:Lowd15@ATC-ENVIRO.COM">Lowd15@ATC-ENVIRO.COM</a> , URL: <a href="http://ATC-ENVIRO.COM">ATC-ENVIRO.COM</a>	\$200 for flexible turnaround
Clayton Group Services, 3380 Chastain Meadows Pkwy., Suite 300, Kennesaw, GA 30144, Contact: Mr. Alan M. Segrave, Phone: 770-499-7500, Fax: 770-423-4990, E-Mail: <a href="mailto:asegrave@claytongroup.com">asegrave@claytongroup.com</a> , URL: <a href="http://www.claytongrp.com">http://www.claytongrp.com</a>	\$190 for 5 day, \$200 for 3-day, turnaround
Eastern Analytical Services, Inc., 4 Westchester Plaza, Elmsford, NY 10523-1610, Contact: Mr. Paul Stascavage, Phone: 914-592-8380, Fax: 914-592-8956, E-Mail: <a href="mailto:PaulS@EASInc.com">PaulS@EASInc.com</a>	\$250 for 3-5 day turnaround
EMSL Analytical, Inc., 107 Haddon Avenue, Westmont, NJ 08108-2799, Contact: Mr. Stephen Siegel, CIH, Phone: 856-858-4800, Fax: 856-858-4960, E-Mail: <a href="mailto:ssiegel@emsl.com">ssiegel@emsl.com</a> , URL: <a href="http://www.emsl.com">www.emsl.com</a>	\$200 for 5 day, \$250 for 3-day, turnaround
Hygeia Laboratories Inc., 82 W. Sierra Madre Blvd., Sierra Madre, CA 91024-2434, Contact: Mr. Gustavo Delgado, Phone: 626-355-4711, Fax: 626-355-4497, E-Mail: <a href="mailto:gdelgado77@atc-enviro.com">gdelgado77@atc-enviro.com</a> , URL: <a href="http://www.atc-enviro.com">http://www.atc-enviro.com</a>	\$200 for 3-5 day, \$250 for 1-2-day turnaround
Hygeia Laboratories, Inc., 9955 NW 116 Way, Suite 1, Miami, FL 33178, Contact: Mr. Julio Lopez, Phone: 305-882-8200, Fax: 305-882-1200, E-Mail: <a href="mailto:LOPEZ31@ATC-ENVIRO.COM">LOPEZ31@ATC-ENVIRO.COM</a> , URL: <a href="http://www.atc-enviro.com">http://www.atc-enviro.com</a>	\$200 for 3-5 day, \$250 for 1-2-day turnaround
International Asbestos Testing Laboratory, 16000 Horizon Way, Unit 100, Mt. Laurel, NJ 08054, Contact: Mr. Frank E. Ehrenfeld, III, Phone: 856-231-9449, Fax: 856-231-9818, E-Mail: <a href="mailto:frankehrenfeld@iatl.com">frankehrenfeld@iatl.com</a> , URL: <a href="http://www.iatl.com">www.iatl.com</a>	\$200 for 5 day, \$250 for 3-day turnaround
Materials Analytical Services, Inc., 3945 Lakefield Court, Suwanee, GA 30024, Contact: Dr. William E. Longo, Phone: 770-866-3200, Fax: 770-866-3259, E-Mail: <a href="mailto:wlongo@mastest.com">wlongo@mastest.com</a> , URL: <a href="http://www.mastest.com">http://www.mastest.com</a>	\$200 for 5 day, \$250 for 3-day turnaround
Reservoirs Environmental Services, Inc., 2059 Bryant Street, Denver, CO 8021, Contact: Ms. Jeanne Spencer Orr, Phone: 303-964-1986, Fax: 303-477-4275, E-Mail: <a href="mailto:jeanneorr@resienv.com">jeanneorr@resienv.com</a>	\$200 for 3-5 day, \$250 for 1-2-day turnaround
Scientific Laboratories, Inc., 13635 Genito Road, Midlothian, VA 23112, Contact: Dr. Thomas R. McKee, Phone: 804-763-1200, Fax: 804-763-1800, E-Mail: <a href="mailto:tmckee@scilabs.com">tmckee@scilabs.com</a> , URL: <a href="http://www.scilabs.com">http://www.scilabs.com</a>	\$200 for 5 day, \$250 for 3-day turnaround

## **EPA TRYING TO REVERSE RESULTS OF OWN STUDIES SHOWING HEPA VACUUMING INEFFECTIVE FOR CARPETS**

On June 19, 2002, just 10 days after my June 9 memorandum which discussed earlier published EPA studies showing that HEPA vacuuming was ineffective in removing asbestos from carpet, EPA Region 2 announced on its web site that it will do new tests to evaluate HEPA vacuuming for carpets.<sup>4</sup>

This is an attempt to reverse the findings of 2 earlier EPA studies that show asbestos embedded in a carpet will not be removed with a HEPA vacuum cleaner. EPA studies also found that even wet process HEPA vacuum systems (steam or water extraction combined with a HEPA vacuum) will only remove 60% of the asbestos. The abstracts of these EPA studies are included in the references of this memo, and the full studies are available online.<sup>5</sup>

The problem is that EPA will only be testing the carpet after cleaning with the microvacuum sampling method, not EPA's ultrasonication carpet test. Obviously, if a carpet is newly vacuumed, trying to find asbestos by going over the carpet again with a hand-held microvacuum is not going to pick up any significant asbestos. If the carpet is subjected to impacts, like being walked on, played on, and boxes dumped on it, the asbestos will come to the surface again.

Of course, EPA's earlier studies used the ultrasonication test method. The studies showed all types of HEPA vacuuming were ineffective. EPA tested the carpet both before and after a variety of HEPA vacuuming methods. The asbestos was not significantly removed.

### **HOW TO TAKE AND SUBMIT SAMPLES**

Call the lab and confirm that they can perform "EPA's ultrasonication extraction asbestos method for carpet using TEM, the Millette method."<sup>6</sup> Use this phrase to describe the test when talking to the lab. The EPA method number is EPA-600/J-93/167, but most lab receptionists will not recognize the method by just this number.

Ask the lab for instructions for sending the sample. Labs will refuse your samples if you do not follow their instructions exactly. Carpet and fabric samples should be enclosed in double Ziplock® sealed baggies.

Laboratories will require that you fill out their Chain of Custody form. Often you can download the chain of custody form from their web site, or they will fax it to you. You must indicate on the form that the carpet is to be tested by the EPA ultrasonication Millette method. You may need to fill in this information in the "OTHER" section of the form. If you do not clearly indicate the test method, the carpet may be analyzed by the bulk PLM method, which you do not want.

Ask them about pre-payment. A credit card number is the most convenient way. The cost of an ultrasonication carpet extraction test is around \$250 for a 3-day turnaround, and \$200 for a 5-day turnaround.

## **Ideas for taking carpet and other fabric samples**

Choose a part of the carpet that would be most contaminated. A high traffic area would be a good choice. Also, a corner of a carpet that cannot be cleaned easily with a vacuum cleaner might be a good choice. A strip along a floorboard under a window that gets dusty is another possibility.

Cutting out 16 square inches of carpet may be a problem, especially if you are a renter. Here are a few strategies: The carpet sample does not need to be in a square shape (4 x 4 inches). It also can be a narrow strip, like 1 x 16 inches or 2 x 8 inches. It also does not necessarily have to be in one piece, but a large number of small pieces will make it very difficult for the lab to measure the exact area.

If you do not have extra matching carpeting to replace the part that is cut out, you may be able to find matching replacement pieces in a closet, under a desk or bookshelf, etc. The carpet sample that would be tested would still come from the place that is most contaminated. However, carpet from the closet or under a desk would be used to fill in the hole left by taking the sample.

Another idea would be to take a carpet sample from the center of hallway, and then replacing just the center of the hallway with contrasting carpeting. An inset rectangle or diamond shape would be very attractive.

For common areas in a building, a carpet-type floor mat could be tested if there is concern about cutting out a piece of a rug or wall-to-wall carpeting. First, purchase a replacement mat yourself. Then, retrieve, replace, and test the old mat.

A long narrow strip from the hem of draperies can be used for the samples, or the drapery lining can be used. For upholstered furniture, a side that does not show can be tested, but it would be preferable to test a piece from a flat, upper horizontal surface which would be more contaminated.

## **Superiority and advantages of the ultrasonication carpet test**

Some argue that testing carpet and fabrics with the hand-held ASTM microvacuum suction pump would be a good enough test, since it would get out the easily releasable asbestos. In this method, carpet and other fabrics are sampled by a hand-held air suction pump. The fabric is essentially vacuumed by the pump. The asbestos is caught on a filter, and then the filter is sent to the lab for testing.

However, this ASTM microvacuum sampling pump is only a first-line test for carpet and other woven fabrics, and is not definitive. The microvacuum pump does not apply any greater suction than a good vacuum cleaner. High impacts, such as a child running or rolling on the carpet, will release much more asbestos than any vacuuming process. The EPA ultrasonication method will extract over 100 times the amount of asbestos from carpet compared to the ASTM microvacuum method. The ultrasonication method is also an official EPA method specific to carpet, and is thus preferred.<sup>7</sup>

The most meaningful asbestos test that a resident can have, whether or not they have a consultant to take samples, is EPA's ultrasonication extraction test for carpeting, draperies, or upholstery fabric. Over 100 times the amount of asbestos will be found in carpet using EPA's ultrasonication test, compared to the ASTM microvacuum sampling method.<sup>8</sup>

An ultrasonication test may be the best way to tell if asbestos is present in a residence or office. Carpeting and upholstered fabric can be tested to see if it needs abatement, or it can be tested after abatement to determine whether it was decontaminated. Hard smooth surfaces may show no asbestos contamination with the ASTM microvacuum method if tested soon after cleaning. But carpeting cannot be cleaned effectively, and will show any residual asbestos.

My 6/9/02 memorandum, titled Carpet, the Asbestos Reservoir, provides information on how to compare the results of the test with any increased risks from asbestos exposure. This memorandum may be found at [www.NYenviroLAW.org](http://www.NYenviroLAW.org).

## REFERENCES

1. The laboratories were located by sending an email inquiry to all asbestos laboratories certified under the National Voluntary Laboratory Accreditation Program and listed on NIST website. Any additional laboratories should contact me so that their laboratory can be included in updated listing.

2. Millette, J.R.; Clark, P.J.; Brackett, K.A.; Wheelles, R.K. (1993) Methods for the analysis of carpet samples for asbestos. Environmental Protection Agency, Cincinnati, OH (United States). Risk Reduction Engineering Lab. (6 pages) NTIS Report Number: PB-93-194355/XAB, EPA Publication Number EPA--600/J-93/167. Available from the National Technical Information Service (NTIS) online for no charge at [www.NTIS.gov](http://www.NTIS.gov)

Millette, J. R., *et al.* (1994) Appendix 4, Methods for the Analysis of Carpet Samples for Asbestos. In: *Settled Asbestos Dust. Sampling and Analysis*, Lewis Publishers, CRC Press.

3. A complete list of all labs certified to perform TEM tests for asbestos is available from the National Institute for Standards and Technology (NIST) Laboratory Accreditation Administration, Gaithersburg, MD 20899 (telephone 301-975-4016), <http://ts.nist.gov/ts/htdocs/210/214/scopes/temtm.htm>

4. EPA BEGINS WORK ON PILOT WTC CLEANING FOR RELEASE: Wednesday, June 19, 2002. <http://www.epa.gov/wtc/stories/061902.html>

Contaminants to be sampled for include asbestos, lead, dioxins, silica, calcite and gypsum, fibrous glass and PAHs (Polynuclear Aromatic Hydrocarbons), which are common by-products of combustion. Dust wipes will be used to collect samples from non-porous surfaces and micro vacs will be used to collect samples from fabrics and other porous materials. Where possible, bulk dust samples will be collected for testing. EPA will also evaluate various methods for cleaning HVAC systems. Laboratory data will be evaluated by EPA to determine the efficiency and effectiveness of each cleanup technique. Personal monitoring will measure possible exposures to the people doing the cleaning.

5. Kominsky, J. R., et al. (1993) Evaluation of Three Cleaning Methods for Removing Asbestos from Carpet: Determination of Airborne Asbestos Concentrations Associated with Each Method, US EPA Risk Reduction Engineering Laboratory, Cincinnati, OH 45268, EPA Publication No. EPA/600/SR-93/155, Posted at [www.epa.gov/ncepihom/nepishom/](http://www.epa.gov/ncepihom/nepishom/)

This study was for real-world asbestos contaminated carpet:

A study was conducted to compare the effectiveness of three cleaning methods for removal of asbestos from contaminated carpet and to determine the airborne asbestos concentrations associated with each. Baseline measurements before cleaning showed an average concentration of 1.6 billion asbestos structures per square foot (s/ft<sup>2</sup>) of carpet. The effectiveness of dry vacuuming using cleaners with and without a high-efficiency particulate air filter was compared with that of wet cleaning with a hot-water extraction cleaner. The wet cleaning method reduced the level of asbestos contamination in the carpet by approximately 60%, whereas neither dry cleaning method had any notable effect on the asbestos level. The type of cleaner used had little effect on the difference between the airborne asbestos concentration before and during cleaning.

Kominsky, J. R., et al. (1991) Evaluation of Two Cleaning Methods for Removal of Asbestos Fibers from Carpet, US EPA Risk Reduction Engineering Laboratory, Cincinnati, OH 45268, EPA Publication No. EPA/600/S2-90/053, posted at [www.epa.gov/ncepihom/nepishom/](http://www.epa.gov/ncepihom/nepishom/)

This study was for artificially asbestos contaminated carpet

The effectiveness of dry-vacuuming and wet-cleaning for the removal of asbestos fibers from carpet was examined, and the potential for fiber reentrainment during carpet cleaning activities was evaluated. Routine carpet cleaning operations were simulated by using high-efficiency particulate air (HEPA) filtered dry vacuum cleaners and HEPA-filtered hot-water extraction cleaners on carpet artificially contaminated with asbestos fibers. Overall, wet-cleaning with a hot water extraction cleaner reduced the level of asbestos contamination in the carpet by approximately 70%. There was no significant change in carpet asbestos concentration after dry-vacuuming. The level of asbestos contamination had no significant effect on the difference between the asbestos concentrations before and after cleaning. Airborne asbestos concentrations were two to four times greater during than before the carpet cleaning activities. Neither the level of asbestos contamination in the carpet nor the type of cleaning method used greatly affected the difference between the airborne asbestos concentration before and during cleaning.

6. Millette, J.R.; Clark, P.J.; Brackett, K.A.; Wheelles, R.K. (1993), *op. cit.*

7. Millette, J. R., *et al.* (1994), *op. cit.*

8. Millette, J.R.; Clark, P.J.; Brackett, K.A.; Wheelles, R.K. (1993), *op. cit.*

Millette, J. R., *et al.* (1994), *op. cit.*