

Environmental Technology Verification Test Plan

Emissions of VOCs and Aldehydes from Commercial Furniture

Prepared by



Research Triangle Institute

Under a Cooperative Agreement with



U.S. Environmental Protection Agency

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The EPA, through its Office of Research and Development (ORD), partially funded and managed the extramural research described here under Cooperative Agreement No. CR 822870.

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Emissions of VOCs and Aldehydes from Commercial Furniture

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EPA Cooperative Agreement CR 822870

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ACRONYMS/DEFINITIONS

AQS	Air Quality Sciences, Inc.
EPA	Environmental Protection Agency
ETL	Enviro-Test Laboratories (ETL)
ETV	Environmental Technology Verification
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
Protocol	ETV Large Chamber Test Protocol for Measuring Emissions from VOCs
RTI	Research Triangle Institute

1. PURPOSE AND OBJECTIVE

The objective of this project is to verify the *Large Chamber Test Protocol for Measuring Emissions of VOCs and Aldehydes* for use with commercial furniture. It is planned to accomplish this in two steps:

- a) quality assurance (QA) test and
- b) test of chairs.

The purpose is to verify the test protocol and the proficiency of the participating laboratories. The results will be presented as verification report and a verification statement.

2. BACKGROUND

The US Environmental Protection Agency (EPA) and its verification organization, Research Triangle Institute (RTI), are working with BIFMA International develop a verification program in furniture. A protocol has been written and review and will be validated using this test plan. The participating laboratories are:

- a) RTI
- b) Air Quality Sciences, Inc. (AQS)
- c) Enviro-Test Laboratories (ETL).

3. APPROACH

Prior to actual chamber testing, a quality assurance test will be performed using sorbent tubes spiked with specific chemicals. RTI, AQS and ETL will participate. The results will be discussed and issues resolved prior to chamber testing. Attachment A provides additional information on this.

The ETV program for commercial furniture will perform limited testing using chairs to validate the test protocol. For the chamber test, RTI and the other laboratories will follow the Protocol developed by RTI and reviewed by the Commercial Furniture Stakeholder Group (see reference). Initially, RTI and AQS will perform the tests. Results will be published as a Verification Statement and Report and will be presented at a Stakeholder meeting.

The chairs will be ordered by RTI and shipped to each laboratory.

Specification: (confidential information)

Two chairs will be ordered for each lab for 4 chairs, total. The chairs will be tested in the chamber at the same time. Therefore a composite emissions will be measured.

4. SCHEDULE

Date	Action
9/14/1998	Laboratories ship 11 sorbent tubes to Debbie Franke, RTI
9/15/1998	Tubes arrive at RTI, will be loaded by EPA
9/17/1998	Tubes shipped out, overnight delivery
9/18/1998	Tubes arrive back at laboratories, analysis performed
9/25/1998	Results of analysis returned to RTI
Week of 9/28/1998	EPA review analyses
Week of 10/5/1998	Conference call to discuss QA tubes analyses and final discussion of chair testing
Week of 10/12/1998	Chairs arrive at RTI and AQS, to be tested and analyzed per the protocol
11/16/1998	Results of chair analysis returned to RTI
12/1/1998	RTI deliver draft verification statement and report to EPA
2/23/1999	Report to stakeholders
	Third lab run chair tests when chamber operational and qualified

5. MANAGEMENT

Ms. Deborah Franke will manage the Commercial Furniture test program. The program is part of the Environmental Technology Verification Pilot Program for Indoor Air Products, led by Dr. David Ensor. Dr. C. Eugene Tatsch will act as QAO for the program. Ms. Franke will identify a contact person at each participating laboratory to coordinate testing and audits.

6. REFERENCES

RTI, *ETV Large Chamber Test Protocol for Measuring Emissions of VOCs and Aldehydes*, Research Triangle Institute, Research Triangle Park, NC, Draft, August, 1998, Final, September 1999.

Attachment A Instructions for Audit Samples

1. Supplying clean cartridges: Each participating lab should supply 11 clean, sealed, sorbent tubes, each containing the laboratory's usual sorbent. These clean tubes should be shipped by overnight carrier in a secure container to Debbie Franke, Research Triangle Institute, Room 408, Bldg. 11, 3040 Cornwallis Rd., Research Triangle Park, NC 27709. Ms. Franke's phone number is 919-541-6000. The tubes will be utilized as follows:

- 3 blank cartridges
- 3 low level spikes
- 3 high level spikes
- 2 extra cartridges for breakage or other contingencies

2. Spiking cartridges: Sorbent tubes will be spiked by flash vaporization at EPA. Each tubes will be assigned a unique number, which should be noted when reporting the analytical results. This first round of evaluations will assess only quantitation. The four compounds selected for this first round of assessments are:

- o-xylene
- limonene
- 2-butoxyethanol
- decane.

(Subsequent evaluations are being planned in which participating laboratories will be asked to both identify and to quantify compounds. Both VOCs and aldehydes may be assessed in future lab evaluations.)

3. Shipment: The nine spiked tubes for the audit will be shipped back to the participating labs by overnight carrier under refrigeration and on a pre-arranged schedule, so that tubes can be analyzed within two weeks of receipt. Dr. Fortmann at Arcadis, in-house contractor to EPA, will arrange for shipment and will consult with the participating labs to determine mutually agreeable schedules. (The other two tubes will be returned to the participating laboratories as soon as possible after receipt of analytical results.) Please contact Dr. Fortmann (919-541-1021) if there are problems with the shipment or with the condition of the tubes.

4. Sample handling: Participating labs should maintain samples at -4°C or less and should analyze the spiked cartridges within 14 days of the date on which the tubes were spiked.

5. Reporting data: Labs should report their analytical results in two ways:

- the concentration of each of the four compounds in each numbered tube
- the toluene equivalent concentration of total volatile organic compounds in each tube.

The following information should also be provided:

Calibration

Procedure used to calibrate instrument for analysis (brief narrative or reference)

Standard material(s) used in calibration

Source(s)

Concentration(s) used

Date received/used

Usual frequency of calibration

Sample handling

Date sample received

Condition on receipt

Storage conditions

Date analyzed

Sample analysis

Instrumentation used (manufacturer/model)

Brief description of the desorption/analysis systems

Analytical procedure

Any unusual circumstances that might have affected the results

Analytical results as well as this additional information, should be sent to Dr. Nancy Adams, USEPA, Mail Drop 91, Research Triangle Park, NC, 27711.