Designation: E1494 – 12

An American National Standard

Standard Practice for Encapsulation Testing of Friable Asbestos-Containing Surfacing Materials[1]

This standard is issued under the fixed designation E1494; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers encapsulants intended to reduce or eliminate the release of asbestos fibers from a matrix of friable spray- or trowel-applied asbestos-containing surfacing material.

1.2 This practice includes a series of determinations to be conducted in the field on asbestos abatement projects for which encapsulation is being considered or has been performed.

1.3 This practice is to be used to determine the appropriateness of encapsulation as an abatement measure in accordance with Practice E1368, as part of a Project Design Survey in accordance with Practice E2356, and to demonstrate completeness of abatement in accordance with Practice E1368. Performance of the encapsulated surfacing material for other purposes is not within the scope of this practice. Use Test Methods E84, E119, and E605 to determine other properties of the material.

1.4 The values stated in SI units are to be regarded as the standard. The values in parentheses are for information only.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.6 **Warning—**Asbestos fibers are acknowledged carcinogens. Breathing asbestos fibers can result in disease of the lungs including asbestosis, lung cancer, and mesothelioma.[2] Precautions in this standard practice should be taken to avoid creating and breathing airborne particles from materials known or suspected to contain asbestos. See 2.3 for regulatory requirements addressing asbestos.

2. Referenced Documents

2.1 *ASTM Standards:*[3]

E84 Test Method for Surface Burning Characteristics of Building Materials

E119 Test Methods for Fire Tests of Building Construction and Materials

E605 Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members

E631 Terminology of Building Constructions

E736 Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members

E1368 Practice for Visual Inspection of Asbestos Abatement Projects

E2356 Practice for Comprehensive Building Asbestos Surveys

2.2 *Other Standards:*

1-GP-205M2003 Sealer for Application to Asbestos-Fiber Releasing Materials[4]

2.3 *EPA and OSHA Regulations:*

40 CFR Part 763 Subpart E, Appendix C (Model Accreditation Plan) Environmental Protection Agency, February 3, 1994[5]

29 CFR1926.1101 Occupational Exposure to Asbestos (Construction Industry Standard), Occupational Safety and Health Administration, August 10, 1994[6]

3. Terminology

3.1 *Definitions*—For definitions of building terms, refer to Terminology E631.

3.2 *Definitions of Terms Specific to This Standard:*

[1] This practice is under the jurisdiction of ASTM D22 on Air Quality and is the direct responsibility of Subcommittee D22.07 on Sampling and Analysis of Asbestos.

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[2] "Elimination of Asbestos-Related Diseases," World Health Organization, September 2006.

[3] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[4] Available from Canadian General Standards Board (CGSB), Place du Portage III, 6B1 11 Laurier Street Gatineau, QuebecK1A 1G6 Canada, http://www.tpsgc-pwgsc.gc.ca/cgsb.

[5] Available from United States Environmental Protection Agency (EPA), Ariel Rios Bldg., 1200 Pennsylvania Ave., NW, Washington, DC 20460, http://www.epa.gov.

[6] Available from Occupational Safety and Health Administration (OSHA), 200 Constitution Ave., NW, Washington, DC 20210, http://www.osha.gov.

3.2.1 *bridging encapsulant, n*—an encapsulant that forms a discrete layer on the surface of an *in situ* asbestos matrix.

3.2.2 *encapsulant, n— for friable asbestos-containing building materials*, a water insoluble material that surrounds or embeds asbestos in an adhesive matrix to prevent release of fibers.

3.2.3 *encapsulation, n*—the process of applying an *encapsulant*.

3.2.3.1 *Discussion*—The terms encapsulation and encapsulant are frequently used to describe the post-removal operation on abatement projects to inhibit the release of fibers from an abated surface. Although the material used for this purpose may be an encapsulant as defined herein, the proper terms are sealer and lock-down. See Practice E1368.

3.2.4 *disturbance, n*—activities that disrupt the matrix of asbestos-containing materials, crumble or pulverize asbestos-containing materials, or generate visible debris from asbestos-containing materials.

3.2.5 *load, n*—force per unit area (kPa or lbf/ft^2) applied to the matrix of the surfacing material, with the area equal to that of the interface between the material and the disc or lid holding the adhesive.

3.2.6 *penetrating encapsulant, n*—an encapsulant that is absorbed by an *in situ* asbestos matrix without leaving a discrete surface layer.

3.2.7 *substrate, n*—a structural or architectural building component to which a surfacing material is applied.

3.2.8 *surfacing material, n*—material that is sprayed, troweled-on, or otherwise applied to interior and exterior structural and architectural surfaces, including but not limited to fireproofing, plaster, and sound-proofing.

4. Significance and Use

4.1 The purpose of this practice is to provide test methods and performance criteria involving encapsulants for surfacing material on an asbestos abatement project in accordance with Practice E1368, including the application of encapsulants to the surfacing material as an abatement measure and the removal of existing encapsulated surfacing material.

4.1.1 Abatement projects involving application of encapsulants require coverage, penetration and cohesion/adhesion tests to determine encapsulation requirements during project design, on test patches and at conclusion of the project to determine completeness of abatement.

4.1.2 Removal projects requires penetration tests during project design on test patches to determine thicknesses of encapsulated and un-encapsulated surfacing material.

4.2 The test methods and performance criteria described in this practice may also be used during a Project Design Survey in accordance with Practice E2356 to provide information for preparing the plans and specifications for applying or removing the encapsulated surfacing material.

4.3 Asbestos-containing surfacing materials installed in buildings may include fireproofing, acoustical and decorative plaster, and soundproofing. Properties not directly addressed in this practice may be important and appropriate test methods should be considered. See Test Methods E84, E119, and E605, and 1-GP-205M2003.

4.4 The test methods described in this practice are designed to (*1*) determine the depth of penetration, or lack thereof, of the encapsulant into the matrix of the surfacing material, (*2*) determine the coverage of the encapsulant on the surfacing material, and (*3*) to determine the adhesive and cohesive properties of the encapsulated surfacing material.

4.5 Compliance with the acceptance criteria in this practice and with referenced specifications does not guarantee that the abatement project will pass the visual inspection for completeness of clean-up in Practice E1368, or that the project will pass final air sampling for clearance, as other factors besides encapsulant performance affect these outcomes.

5. Qualifications

5.1 The test methods in this practice require disturbance of asbestos-containing materials. Activities that disturb asbestos-containing materials are subject to regulations of the Occupational Safety and Health Administration (OSHA), the Environmental Protection Agency (EPA) and other jurisdictions including certain state agencies.

5.2 The test method described in Annex A1 to determine the adhesive and cohesive properties of encapsulated surfacing material can result in a release of asbestos-containing debris. Persons conducting this test must have the appropriate credentials and training to clean up the debris.

5.3 The test method described in Annex A2 to determine depth of penetration requires taking core samples of the encapsulated surfacing material. This activity requires accreditation as an asbestos inspector according to the EPA Model Accreditation Plan.

6. Cohesion/Adhesion Tests

6.1 *Tests On Encapsulated Surfacing Materials:*

6.1.1 The cohesion/adhesion test shall determine whether the encapsulant adversely affects the *in situ* cohesive and adhesive strength of the friable asbestos-containing surfacing material and shall be in accordance with Annex A1.

6.1.2 The load required to cause adhesion or cohesion failure of the encapsulated matrix shall not be less than the load required to cause failure of the unencapsulated matrix. In no case shall the load-holding capabilities of the unencapsulated matrix be less than the load imposed by the applied encapsulation materials.

6.1.3 The load required to cause adhesion or cohesion failure of the encapsulated matrix shall not be less than the load required to cause failure of the unencapsulated matrix, and in no case shall the load be less than 2.4 kPa (50 lbf/ft^2).

6.1.4 Internal failure of the encapsulated matrix is due to horizontal delamination within the encapsulated or un-encapsulated material, separation at the interface between the encapsulated and un-encapsulated materials, or separation at the interface between the un-encapsulated material and the substrate. Shear forces across a vertical cylindrical surface equal to the diameter of the disc or lid times the thickness of

the material from the exposed surface to the plane of delamination act to resist failure but are not considered in the calculation of loads.

6.2 *Tests On Un-Encapsulated Surfacing Materials:*

6.2.1 The cohesion/adhesion test shall determine the *in situ* cohesive and adhesive strength of the friable asbestos-containing surfacing material and shall be in accordance with Annex A1.

6.2.2 The load required to cause adhesion or cohesion failure of the matrix shall not be less than the manufacturer's specification for the surfacing material.

6.2.3 Internal failure of the matrix is due to horizontal delamination within the material or separation at the interface between the material and the substrate. Shear forces across a vertical cylindrical surface equal to the diameter of the disc or lid times the thickness of the material from the exposed surface to the plane of delamination act to resist failure but are not considered in the calculation of loads.

7. Coverage and Penetration Tests

7.1 *Coverage Rate*—The coverage rate for encapsulants used on surfacing material shall be at the level required by the matrix system field installation, as established by spraying a test area (test patch) using the specified encapsulant.

7.1.1 For penetrating encapsulants, the coverage rate to achieve encapsulation is the saturation (maximum) coverage rate for the particular asbestos-containing material. Saturation is achieved when no further absorption of the encapsulant into the matrix is observed. Coverage shall be reported as liquid volume applied per unit area.

7.1.2 For bridging encapsulants, the coverage rate to achieve encapsulation occurs when a void-free uniform coating is formed over the surface of the matrix. Application quantity must be sufficient to achieve the manufacturer's minimum dry-thickness requirements. Coverage shall be reported as liquid volume per unit area.

7.2 *Penetration Depth:*

7.2.1 The penetration test values shall determine whether or not the encapsulant shall be classified as a penetrating encapsulant or bridging encapsulant, in accordance with the test method in Annex A2. Encapsulation coverage rate used to prepare specimens for testing shall be the saturation (maximum) coverage rate as determined in 7.1.

7.2.2 If penetration to a depth of 10 mm (⅜ in.) of the matrix occurs, the product is classified as a penetrating encapsulant. Products having lesser penetrations are classified as bridging encapsulants. Differing fibrous matrices as installed in the field may affect the penetration rate.

8. Keywords

8.1 asbestos; bridging encapsulant; encapsulant; penetrating encapsulant

ANNEXES

(Mandatory Information)

A1. TEST METHOD TO DETERMINE THE COHESION/ADHESION PROPERTIES OF FRIABLE SPRAY- OR TROWEL-APPLIED ASBESTOS-CONTAINING SURFACING MATERIALS

A1.1 Scope

A1.1.1 This test method covers a procedure for determining the cohesion/adhesion strength of friable spray- or trowel-applied surfacing materials by the application of a force perpendicular to the surface. This test method is applicable to both encapsulated and unencapsulated surfacing materials.

NOTE A1.1—This Annex A1 is based on Test Method E736.

A1.2 Summary of Test Method

A1.2.1 The property of cohesive/adhesive strength is determined using a disc or lid attached to the material with an adhesive. A spring-loaded scale or weights are suspended from the disc or lid with a hook to allow manual application of increasing force until cohesive/adhesive failure occurs or a predetermined load is reached.

NOTE A1.2—The lid can be an ordinary jar lid. The disc can be the removable insert from a two-piece canning jar lid.

A1.2.2 This test method is intended for surfacing materials applied to horizontal surfaces such as ceilings, decks and bottoms flanges of beams. It may be used on vertical surfaces with modifications to the testing apparatus that are beyond the scope of this method.

A1.3 Significance and Use

A1.3.1 This test method measures the load required to separate either untreated or encapsulated material from the substrate, as well as the internal cohesive strength of the material, and is an indication of the ability of the material to remain in place and resist separation during anticipated service conditions.

A1.3.2 Unless the presence or absence of asbestos in the surfacing material has previously been established, collect bulk samples and analyze them according to Practice E2356. If the surfacing material does not contain asbestos, the precautions for exposure to asbestos fibers may be dispensed with.

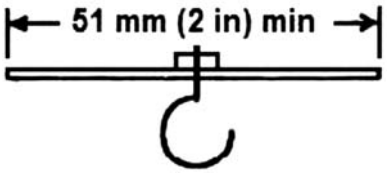

FIG. A1.1 Disc and Hook

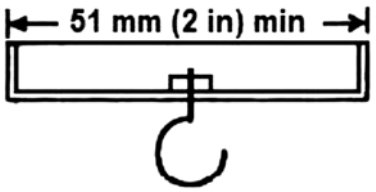

FIG. A1.2 Lid and Hook

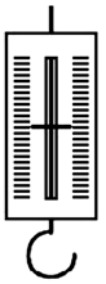

FIG. A1.3 Spring-Loaded Scale

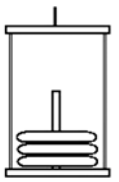

FIG. A1.4 Weights and Holder

A1.4 Health and Safety Hazards

A1.4.1 This test method may require contact with, and result in disturbance of, friable asbestos-containing material. Persons conducting the testing must be trained according to applicable EPA, OSHA and state regulations.

A1.4.2 The materials to be tested are commonly installed on ceilings, decks and structural steel elements, requiring some steps of the method to be done at elevated locations. Ladders, scaffolds and man-lifts must be used in accordance with OSHA regulations, which may also require fall protection devices.

A1.4.3 Failure of the material to withstand the applied load may result in hazards that require the following precautions.

A1.4.3.1 The release of asbestos-containing debris and airborne asbestos fibers requires that persons conducting the test wear protective clothing and respiratory protection. If a release occurs they must be prepared to decontaminate their clothing and themselves.

A1.4.3.2 Unless measures are taken to restrain it, the part of the test apparatus that separates from the material will fall while the person applying the load is directly underneath. This person must wear a hard hat and be prepared to move quickly out of the way of falling objects and debris.

A1.4.3.3 Material failure may constitute a fiber release episode that contaminates the immediate area. Preparation for the test must include isolation measures to restrict access by unauthorized persons and negative pressure enclosures may be required in occupied buildings. Plastic sheeting is required to protect floors, furniture and fixtures that may be contaminated by falling debris. Clean-up of debris will require a HEPA-filtered vacuum and wet-wiping of surfaces.

A1.4.4 Personal air sampling must be performed on persons conducting the testing to demonstrate compliance with the OSHA Permissible Exposure Limits for asbestos. In occupied buildings area air samples should be taken to show that fiber levels are below specified limits.

A1.5 Test Apparatus

A1.5.1 The test apparatus consists of the following devices.

A1.5.2 The device that is attached to the bottom surface of the material to be tested consists of a disc or lid with a hook attached in the center (Fig. A1.1 and Fig. A1.2). The disc or lid shall be a minimum of 51 mm (2 in.) in diameter. The disc or lid is attached to the material with an adhesive.

A1.5.3 The device that applies the load shall be a spring-loaded scale (Fig. A1.3) or a fixture to which weights are added (Fig. A1.4). This device is suspended from the disc or lid by a light rope or metal chain.

A1.6 Test Preparation

A1.6.1 If an encapsulant is being tested as an abatement procedure, several test patches must be prepared prior to conducting the tests. Treat an area 300 by 300 mm (12 by 12 in.) for each test patch.

A1.6.2 For a penetrating encapsulant treat each test patch in accordance with the manufacturer's coverage recommendations for a minimum 10-mm (⅜-in.) thickness or until saturation is achieved. Determine the depth of penetration according to Annex A2 of this method.

A1.6.3 For a bridging encapsulant, apply in accordance with the manufacturer's recommendations so as to achieve a void-free uniform coating over the surface.

A1.7 Test Procedure

A1.7.1 For each set of tests a written procedure shall be prepared that incorporates the requirements of this method, specifies the objectives of the testing, the locations of the materials to be tested, the loads to be applied and the manner in which they are to be applied, and the criteria for passing the tests.

A1.7.2 The procedures shall include provisions and precautions applicable to the specific set of tests, including any health and safety requirements in addition to those in Section A1.4.

A1.7.3 Apply adhesive sufficient to cover the disc or fill the lid and immediately place the disc or lid against the surface of the material and press firmly. Refer to Fig. A1.5.

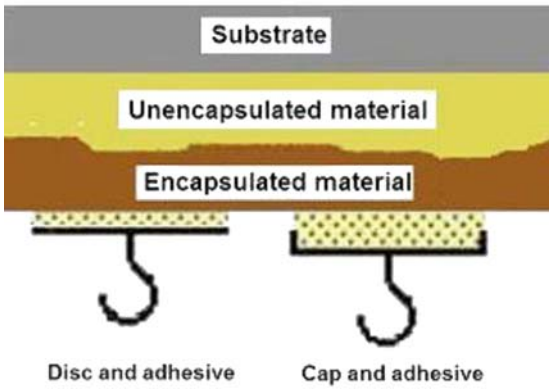

FIG. A1.5 Disc and Lid Attached to Material

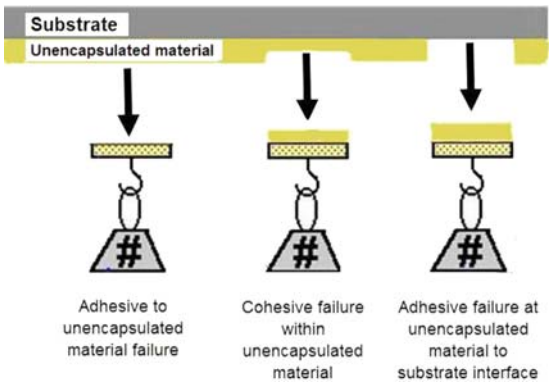

FIG. A1.6 Failure Modes for Unencapsulated Material

A1.7.4 Support the disc or lid at the surface until the adhesive has adequately cured. Wipe away any excess adhesive around the disc or lid before it cures, or carefully cut it away after it cures.

A1.7.5 Attach the top end of the rope or chain to the hook on the disc or lid.

A1.7.5.1 To use the spring-loaded scale, attach it to the bottom end of rope or chain and pull down on the scale's bottom hook.

A1.7.5.2 To use the weight holder, attach it to the bottom end of rope or chain and begin adding weights to the holder.

A1.7.6 Apply an increasing downward force to the scale or add weights to the holder for successive periods of one minute until failure of the material occurs or a pre-determined load is reached. Record the reading on the scale or the amount of weight added when the test is terminated.

A1.7.7 If failure occurs record the mode of failure as shown in Fig. A1.6 for unencapsulated material or Fig. A1.7 for encapsulated material.

A1.7.7.1 Failure can occur at the interface between the adhesive and the encapsulated or unencapsulated material. This is not a failure of the material.

A1.7.7.2 Failure can occur within the encapsulated or unencapsulated material.

A1.7.7.3 Failure can occur at the interface between the encapsulated and unencapsulated material.

A1.7.7.4 Failure can occur at the interface between the unencapsulated material and the substrate.

A1.8 Calculations

A1.8.1 Calculate the load applied to the material as:

$$L = F/A \qquad \text{(A1.1)}$$

where:

L = load, Pa (lbf/ft^2),
F = recorded force, N (lbf), and
A = area of the disc or lid, m^2 (ft^2).

A1.8.2 The load, L, acts across the horizontal surface where failure occurs (see Fig. A1.6 and Fig. A1.7). The recorded force, F, is the reading on the spring-loaded scale or the amount of weight added to the holder plus the weight of the holder.

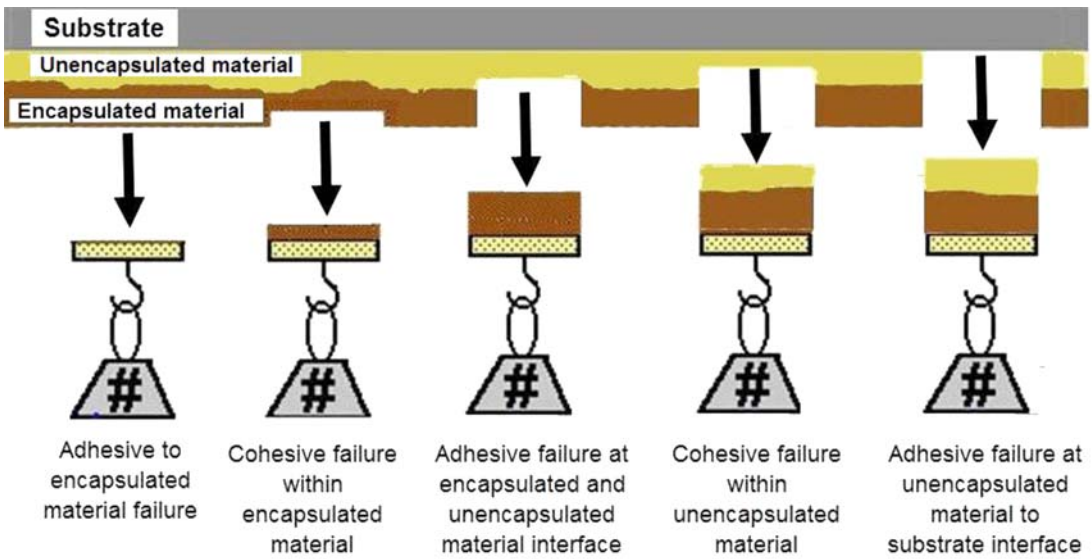

FIG. A1.7 Failure Modes for Encapsulated Material

A1.8.3 Consult the manufacturer's material specification for the design load capabilities of the materials being tested.

A1.9 Report

A1.9.1 Report test results as follows:
A1.9.1.1 Applied force (scale reading or weight),
A1.9.1.2 Duration of applied force,
A1.9.1.3 Failure did or did not occur,
A1.9.1.4 Time of failure if it occurs, and
A1.9.1.5 Mode of failure (see A1.7.7).

A1.9.2 Report other pertinent information (location, type of material, thickness, etc.).

A2. TEST METHOD TO DETERMINE THE DEPTH OF PENETRATION OF WATER INSOLUBLE PENETRATING ENCAPSULANTS

A2.1 Scope

A2.1.1 This test method covers a procedure for estimating the depth of penetration of a penetrating encapsulant when applied to friable surfacing material.

A2.2 Summary of Test Method

A2.2.1 The effectiveness of a penetrating encapsulant applied over friable surfacing material is shown by the extent to which a plug removed from the matrix by the technique outlined below retains its physical integrity after immersion in water.

A2.2.2 Because the encapsulant may not penetrate to the substrate, this test method shall follow the precautions required for collection of a bulk sample of suspect asbestos-containing surfacing material.

A2.3 Significance and Use

A2.3.1 For application of an encapsulant, this test method is an indication of the ability of the encapsulant to penetrate the friable surfacing material to the required minimum depth for a penetrating encapsulant and to the depth specified in the project design. For existing installations, this test method provides information on the depth of penetration to be used in the project design for an abatement project.

A2.3.2 Unless the presence or absence of asbestos in the surfacing material has previously been established, collect bulk samples and analyze them according to Practice E2356. If the surfacing material does not contain asbestos, the precautions for exposure to asbestos fibers may be dispensed with.

A2.4 Health and Safety Hazards

A2.4.1 If this test method results in disturbance of friable asbestos-containing material, persons conducting the testing must be trained according to applicable EPA, OSHA and state regulations for collecting bulk samples.

A2.4.2 The materials to be tested are commonly installed on ceilings, decks and structural steel elements, requiring some steps of the method to be done at elevated locations. Ladders, scaffolds and man-lifts must be used in accordance with OSHA regulations, which may also require fall protection devices.

A2.4.3 During certain steps of the test, persons conducting the test must use respiratory protection. In some locations, such as a ceiling plenum with fireproofing, protective clothing is required.

A2.5 Test Apparatus

A2.5.1 *Cork Borer or Hole Cutter*— Approximately 19 mm (¾ in.) standard diameter laboratory cork borer and an 16 mm (⅝ in.) hardwood dowel to be used as a plunger to expel the cut specimen from the borer with minimal mechanical damage.

A2.5.2 *Small Jar with Lid*, to contain specimen. A 35 mm plastic film container is suitable.

A2.5.3 *Metric/English Rule*, 150 mm (6.0 in.).

A2.5.4 *Glass beakers*, 250 ml (15.25 $in.^3$).

A2.5.5 *HEPA-filtered exhaust hood.*

A2.5.6 *Mini-enclosure* of plastic sheeting, placed under negative pressure.

A2.5.7 *HEPA-filtered vacuum cleaner.*

A2.5.8 *Caulking material*, compatible with encapsulant and surfacing material.

A2.5.9 *Shrink band*, cellulose band for sealing air sampling cassettes will fit 35 mm film containers.

A2.6 Test Preparation

A2.6.1 If an encapsulant is being tested as an abatement procedure, several test patches must be prepared prior to conducting the tests. These patches must be prepared using protective measures applicable to encapsulation as an abatement procedure.

A2.6.1.1 Erect the mini-enclosure around the area to be treated as a test patch and place it under negative pressure with the HEPA-filtered vacuum cleaner.

A2.6.1.2 Treat an area 300 by 300 mm (12 by 12 in.) for each test patch.

A2.6.1.3 Wet-wipe the inside of the mini-enclosure and pick up any debris with the HEPA-filtered vacuum cleaner.

A2.6.1.4 Dismantle the mini-enclosure and move it to the next location, or dispose of the mini-enclosure as asbestos-contaminated waste material and construct a new enclosure.

A2.6.1.5 Allow the encapsulant to cure according to the manufacturer's recommendations before conducting the tests.

A2.6.2 If an installed encapsulant is being tested, follow the procedures in Appendix X1 of Practice E2356 for collecting bulk samples of surfacing materials.

A2.7 Procedure for Collecting Specimens

A2.7.1 Examine a minimum of four specimens—one specimen for each test patch for encapsulant being tested as an abatement procedure and specimens from representative locations on installed encapsulated surfacing materials.

A2.7.2 Using the cork borer or hole cutter, carefully excise a core or plug of the encapsulated material to the substrate. To prepare a clean-cut specimen, when the substrate is reached, move the borer laterally to cleanly shear the core or plug from the substrate. Remove the borer and plug from the matrix. See Fig. A2.1(a).

A2.7.3 Using the bore plunger, gently push the plug from the interior of the borer into the open jar and place the lid on the jar. Wet-wipe the surface of the jar, seal the lid with a shrink band and place a label on the jar with the specimen identification. See Fig. A2.1(b).

A2.7.4 Seal the penetration left by removing the plug with a suitable caulking material.

A2.7.5 Follow the procedures in Appendix X1 of Practice E2356 to clean-up any debris generated while collecting the specimen.

A2.8 Procedure for Testing Specimens

A2.8.1 Place the 250 ml beakers in the HEPA-filtered exhaust hood. Open the jars in the exhaust hood and remove the specimens, placing each specimen in a separate beaker. See Fig. A2.1(c).

A2.8.2 Using the ruler, measure the thickness of the encapsulated and unencapsulated material and record the measurement for each specimen.

A2.8.3 Fill each beaker with water containing a surfactant (such as liquid detergent) to a depth sufficient to immerse the specimen. Allow the specimens to soak for a period of 4 hours with no agitation.

A2.8.4 After the specimens have been placed in the beakers, the HEPA-filtered exhaust hood may be turned off and the beakers removed from the hood.

A2.8.5 After soaking for 4 hours, remove each specimen for examination. Using a ruler, measure the length of the plug that is still intact, that is, held together by the encapsulant. See Fig. A2.1(d).

A2.8.6 Discard the asbestos-contaminated water in the beakers and the rags or towels used to clean the beakers, cork borers and plungers according to applicable regulations. Do not pour the water down the drain of a laboratory sink.

A2.9 Report

A2.9.1 Report the length of each specimen that has remained intact as the depth of penetration, and calculate an average of the values obtained on all specimens.

A2.9.2 Describe the encapsulant tested, including manufacturer's type or designation, number of coats, total coverage rate realized for the particular installation, cure conditions, and total cure time.

A2.9.2.1 If the average depth of penetration exceeds 10 mm (⅜ in.) the encapsulant shall be classified as a penetrating encapsulant.

A2.9.2.2 If the average depth of penetration does not exceed 10 mm (⅜ in.) the encapsulant shall be classified as a bridging encapsulant.

A2.9.3 Describe the matrix system encapsulated, including type (fibrous or cementitious), thickness and type and percent of asbestos fiber(s).

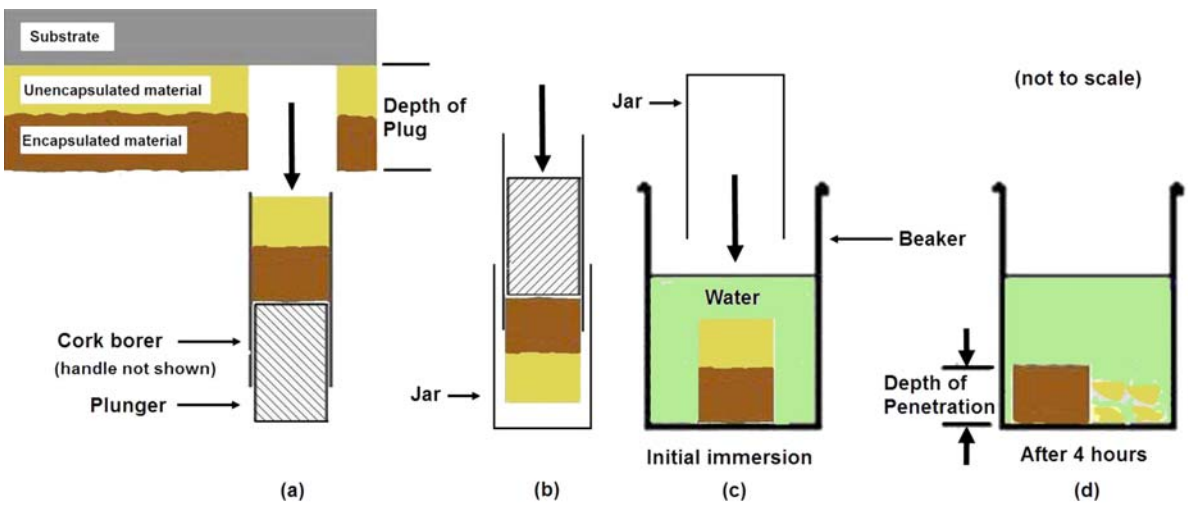

FIG. A2.1 Depth of Penetration Test