Designation: F 1550 – 00

Standard Test Method for Determination of Fire-Test-Response Characteristics of Components or Composites of Mattresses or Furniture for Use in Correctional Facilities after Exposure to Vandalism, by Employing a Bench Scale Oxygen Consumption Calorimeter[1]

This standard is issued under the fixed designation F 1550; 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.

INTRODUCTION

In correctional occupancies, vandalism of mattresses or furniture occurs with significant frequency. After such vandalism, it is possible that the filling material (foam or other padding) of the mattress or furniture becomes exposed. If the mattress or furniture filling material is exposed, it is possible for a product which meets prescribed fire-test-response characteristics in its intact state to perform in a decidedly less satisfactory manner. This standard test method provides a means for measuring, in bench scale, fire-test-response characteristics of composite upholstered components of mattresses or furniture, for use in correctional facilities, after having been vandalized in a prescribed manner so as to expose the filling material, using an oxygen consumption calorimeter.

1. Scope

1.1 This fire-test-response standard is designed for use to determine various fire-test-response characteristics, including ignitability and heat release rate, from composites of mattresses or furniture, or correctional facilities, which have been vandalized in a prescribed manner to expose the filling material, by using a bench scale oxygen consumption calorimeter.

1.2 This test method provides for measurements of the time to sustained flaming, heat release rate, peak and total heat release, and effective heat of combustion at a constant radiant heat flux of 35 kW/m^2.

1.3 The apparatus used in this test method is also capable of determining heat release data at different heat fluxes.

1.4 The specimen is oriented horizontally and a spark ignition source is used.

1.5 All fire-test-response characteristics are determined using the apparatus and the procedures described in Test Method E 1354.

1.6 The tests are done on bench-scale specimens combining the mattress or furniture outer layer components. Frame elements are not included.

1.7 The vandalism is simulated by causing a prescribed cut on the outer layer of the composite, deep enough to expose the filling material to the incident radiation.

1.8 The values stated in SI units are to be regarded as the standard.

1.9 *This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire hazard or fire risk assessment of the materials, products, or assemblies under actual fire conditions.*

1.10 *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.* For specific safety precautions, see Section 7.

2. Referenced Documents

2.1 *ASTM Standards:*

D 123 Terminology Relating to Textiles[2]

E 176 Terminology of Fire Standards[3]

E 1354 Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter[3]

E 1474 Test Method for Determining the Heat Release Rate of Upholstered Furniture and Mattress Components or Composites Using a Bench Scale Oxygen Consumption Calorimeter[3]

[1] This test method is under the jurisdiction of ASTM Committee F33 on Detention and Correctional Facilities and is the direct responsibility of Subcommittee F33.05 on Furnishings and Equipment.

Current edition approved Aug. 10, 2000. Published November 2000. Originally published as F 1550M – 94. Last previous edition F 1550M – 96a.

[2] *Annual Book of ASTM Standards*, Vol 07.01.

[3] *Annual Book of ASTM Standards*, Vol 04.07.

E 1537 Test Method for Fire Testing of Seating Upholstered Furniture[3]

E 1590 Test Method for Fire Testing of Mattresses[3]

2.2 *ISO Standards:*

ISO 13943 Fire Safety–Vocabulary[4]

ISO 4880 Burning Behaviour of Textiles and Textile Products—Vocabulary[4]

2.3 *California Bureau of Home Furnishings and Thermal Insulation Standards:*[5]

CA Technical Bulletin 129 (October 1992), Flammability Test Procedure for Mattresses for Use in Public Buildings

CA Technical Bulletin 133 (January 1991). Flammability Test Procedure for Seating Furniture for Use in Public Occupancies

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this test method and associated with fire issues, refer to the terminology contained in Terminology E 176 and in ISO 13943. In case of conflict, the terminology in Terminology E 176 shall prevail.

3.1.2 For definitions of terms used in this test method and associated with textile issues, refer to the terminology contained in Terminology D 123 and in ISO 4880. In case of conflict, the terminology in Terminology D 123 shall prevail.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *effective heat of combustion*, *n*—the measured heat release divided by the mass loss for a specified time period.

3.2.2 *heat release rate*, *n*—the heat evolved from the specimen, expressed per unit area of exposed specimen area per unit of time.

3.2.3 *heating flux*, *n*—the prescribed incident flux imposed externally from the heater onto the specimen at the initiation of the test.

3.2.4 *ignitability*, *n*—the propensity for ignition, as measured by the time to sustained flaming at a specified heating flux.

3.2.5 *mattress*, *n*—a mattress is a ticking (outermost layer of fabric or related material) filled with a resilient material used alone or in combination with other products intended or promoted for sleeping upon.

3.2.6 *net heat of combustion*, *n*—the oxygen bomb calorimeter value for the heat of combustion, corrected for the gaseous state of product water.

3.2.7 *orientation*, *n*—the plane in which the exposed face of the specimen is located during testing, which is horizontal facing up for this test.

3.2.8 *oxygen consumption principle*, *n*—the expression of the relationship between the mass of oxygen consumed during combustion and the heat released.

3.2.9 *sustained flaming*, *n*—existence of flame on or over the surface of the specimen for periods of 4 s or more.

3.2.10 *upholstered*, *n*—covered with material (as fabric or padding) to provide a soft surface.

[4] Available from International Standardization Organization, P.O. Box 56, CH-1211: Geneva 20, Switzerland.

[5] Available from California Bureau of Home Furnishings and Thermal Insulation, State of California, Department of Consumer Affairs, 3485 Orange Grove Avenue, North Highlands, CA 95660-5595.

4. Summary of Test Method

4.1 This test method is based on the observation that, generally, the net heat of combustion is directly related to the amount of oxygen required for combustion **(1)**.[6] Approximately 13.1×10^3 kJ of energy are released as heat for each kg of oxygen consumed. Specimens in the test are burned in ambient air conditions, while being subjected to a prescribed external heating flux of 35 kW/m^2.

4.2 The heat release is determined by the measurement of the oxygen consumption, as determined by the oxygen concentration and the flow rate in the combustion product stream, as described in Test Method E 1354.

4.3 The primary measurements are oxygen concentration and exhaust gas flow rate, used to calculate heat release. Additional measurements include the mass loss rate of the specimen, the time to sustained flaming, and the effective heat of combustion. Ignitability is determined by measuring the time for initial exposure to time of sustained flaming of the specimen.

4.4 In order to simulate vandalism, the outer layers of the composite to be tested are cut across the surface, in the form of an X, to expose the interior filling material.

4.5 The procedure in this test method is identical to that in Test Method E 1474, except for the slashing of the surface of the specimen prior to testing.

5. Significance and Use

5.1 This test method provides a means to determine various fire-test-response characteristics, including the time to sustained flaming and the heat release rate, of composites exposed to a prescribed heat flux in the cone calorimeter apparatus, after they have been vandalized in a prescribed manner, to expose the filling material.

5.2 It is clearly impossible to predict the manner in which a mattress or furniture will be vandalized. The objective of this test method is to develop data indicating the effect of violating the integrity of the fabric (or fabric-interliner) protection and exposing the padding to the source of heat (see Appendix X3).

5.3 Quantitative heat release measurements provide information which is useful for product design and product development, for mattresses or furniture destined for correctional occupancies.

5.4 Heat release measurements provide useful information for product development by giving a quantitative measure of specific changes in fire performance caused by component and composite modifications. Heat release data from this method will not be predictive of product behavior if the product will not spread flame over its surface under the fire exposure conditions of interest.

5.5 The use of test specimens simulating vandalism allows the investigation of the variation in response between the system as designed by the manufacturer and the way the system is occasionally present in actual use, with the filling material exposed to the incident energy.

5.6 This test method allows alternative strategies to be employed for producing a product (mattress or upholstered

[6] The boldface numbers in parentheses refer to the list of references at the end of this standard.

furniture) with the required fire-test-response characteristics for the scenario under consideration.

5.7 *Limitations*:

5.7.1 The test data are invalid if any of the events in 5.7.1.1 or 5.7.1.2 occur.

5.7.1.1 Explosive spalling.

5.7.1.2 The specimen swells sufficiently prior to ignition to touch the spark plug or swells up to the plane of the heater base during combustion.

5.7.2 This test method is not applicable to ignition by cigarettes, or by any other smoldering source.

5.7.3 The ignition source in this test method is a radiant energy source of relatively high intensity (35 kW/m incident flux). It has been shown that this source models well, for furniture composites, a full scale source equivalent to 5 sheets of newspaper **(2)**. It has also been shown that upholstered furniture and mattresses, particularly in public occupancies, are, on occasion, involved in fires after exposure to flaming ignition sources, However, it is not known what fraction of actual flaming mattress or furniture fires occur with ignitions more or less intense than the one modeled here.

5.7.4 It is not known whether the results of this test method will be equally valid when it is carried out under conditions different from the specified ones. In particular, it is unclear whether the use of a different ignition source, or the same ignition source but at a different incident heat flux, will change relative results.

5.7.5 The value of heat release rate corresponding to the critical limit between propagating mattress fires and non-propagating mattress fires is not known.

5.7.6 It is not known what fraction of the vandalism that occurs is represented by the prescribed model used in this standard. However, the method described here is adequate to address one of the major objectives of the standard, namely investigate the effect of the exposed filling material on the fire-test-response characteristics of the composite.

6. Apparatus

6.1 Use the apparatus described in Test Method E 1354, also known as the cone calorimeter, for this test.

7. Safety Precautions

7.1 These test procedures involve high temperatures and combustion processes. Therefore, there is a potential hazard for burns, ignition of extraneous objects or clothing, and for inhalation of combustion products.

7.2 The operator must use protective gloves for insertion and removal of the test specimens. The operator must refrain from touching either the cone heater or the associated fixtures while hot, except with the use of protective gloves.

8. Test Specimen Preparation (Method A)

8.1 *Equipment and Supplies for Specimen Preparation **(3)***:

8.1.1 *Cutting Equipment*—Cut foams with a band saw. Use a foam-cutting blade. This blade has no teeth. Instead, it has a wavy scallop to the edge. Ensure that the blade is well sharpened, and make certain that no silicones or other oils are applied to lubricate the blade. Lubrication must be solely with graphite or molybdenum compounds. The band saw blade must make a straight and true cut of the foam; therefore, set the blade guide no higher than 12 mm above the stock to be cut.

8.1.2 *Forming Blocks*—The specimen preparation rests crucially upon the proper use of forming blocks. These blocks are made in dimensions of $98 \times 98 \times 50$ mm. Each of these dimensions must be controlled to $\pm$ 0.5 mm. As the material for the forming blocks, use a dense wood, such as maple, which is minimally subject to dimensional changes when the humidity is changed. Do not use pine. Use only fully kiln-dried timber for making the forming blocks. Ensure that all surfaces are cut straight and true and are smooth. Do not round the edges but slightly round the corners. It is preferable to lacquer the blocks with an acrylic lacquer to ensure a hard, smooth, stable surface. Make up a minimum of 12 blocks to allow a reasonable number of specimens to be prepared at the same time.

8.1.3 *Adhesive*—Several adhesives have been found suitable for securing the fabrics. The adhesive must be low in flammability and must have suitable holding power to permit inserting the resilient padding, stay in place until the testing is performed (that is, through the required conditioning) and during the flammability test procedure. For the latter, the glued portions of the fabric must neither flame excessively nor retard burning. Adhesives that are based on polychloroprene (neoprene),[7] acrylic or water have been found suitable.

8.1.3.1 *Adhesive Application*—The method of adhesive application depends on the particular adhesive selected. Water-soluble adhesives are applied directly from the bottle, and therefore, do not require a brush. Likewise, any spillage is readily cleanable with water. This type of adhesive does not set as quickly as the solvent-based adhesives, which permits shifting the fabric as necessary to create a neat, tight package. The glued specimen must be left overnight, however, to ensure a good seal. On the other hand, polychloroprene-based adhesives are applied with a brush made of hog bristles or other stiff, course material. The brush must be flat and square cut with a width of 7 to 8 mm. A solvent compatible with the adhesive must be used for cleanup and storage of the brush. The solvent-based glues set up very quickly and do not permit any adjustment around the wood block.

8.1.3.2 *Adhesive Checking*—To test the efficiency of an adhesive, apply a small amount on two small pieces of the fabric or interliner to be used. Allow the adhesive to dry (at least overnight), and then attempt to tear the fabric pieces from one another. To be acceptable, the glued pieces must not be able to be separated without tearing the fabric.

8.1.4 *Tape*—Masking tape or other tape with adhesive is used to assist in assembling the test composites. Any type of tape that will adhere adequately to all fabrics and be easy to remove after completion of assembly is suitable for this purpose. Some interliners or fabrics will be damaged by direct

[7] Parabond A-1535, obtained from Para-Chem Southern, Inc., Simpsonville, South Carolina, is a neoprene, solvent-based adhesive (polychloroprene in methylene chloride solvent) that has been found suitable. An acrylic, water-based adhesive, DAP Weldwood Hobby 'n Craft Glue, readily available in hardware and craft stores also has been found suitable. The latter adhesive is often called "white glue" and has been proven adequate for many, but not all, fabrics and interliners tested by a United States testing laboratory. Other adhesives also are suitable, provided they meet the stated requirements.

application of masking tape to their surface since removal results in tearing or marring the surface. For items susceptible to such damage, prepare strips of paper slightly wider than the width of the masking tape and long enough to reach all the way around the forming block. Then secure the paper strips with tape.

8.1.5 *Aluminum Foil*—Use aluminum foil that is 0.03–0.04 mm thick.[8] No other foil thickness shall be used. It is especially important not to substitute a thicker foil.

8.2 *Basic Preparation of Specimens*:

8.2.1 The basic instructions here pertain to specimens that comprise only a single layer of fabric over a single layer of resilient padding. The same instructions apply to specimens where an interliner is laminated onto the back of the fabric. In the latter case, the fabric/interliner combination is treated simply as a fabric alone. For specimens that use multiple padding layers, separate interliner layers, and other more specialized constructions. Supplemental instructions are given in 8.3.

8.2.2 *Cutting of Resilient Padding Blocks*—The thickness of the resilient padding block will normally be 50 mm when a single layer of resilient padding is the only padding material used in the composite. With a typical fabric thickness, this will result in a total specimen thickness of approximately 50.9 mm, which is acceptable. Cut square each resilient padding block with 90° corners and face dimensions of 102.5± 0.5 mm by 102.5 ± 0.5 mm. This size ensures that the resilient padding will be compressed during composite assembly, leading to tight, well-formed specimens.

8.2.2.1 Some resilient paddings have a tendency for high friction against the sawing table and the guide. To make a smooth cut by allowing the resilient padding to slide easier, put a piece of paper between the resilient padding and the table/guide. Push the assembly of resilient padding and paper forward and allow the blade to cut through both the resilient padding and the paper.

8.2.3 *Forming Resilient Padding Blocks*—The cone calorimeter test results will not be repeatable if the density of the resilient padding tested is not controlled very closely. For this purpose, each batch of resilient padding specimens prepared must be checked for mass. It is assumed here that three replicate tests will be performed for each specimen type. Once three blocks of resilient padding have been cut, the mass must be determined. No block shall have a mass of more than 105 % of the mean of the three masses nor a mass of less than 95 %. If such a difference occurs, additional blocks must be cut and the mass determined. The preparation of composites cannot start until three blocks of resilient padding, which conform to the above 5 % deviation limit, have been obtained. Mark the accepted blocks so as to be traceable. Note the mass of each block of resilient padding along with the identification marks of the blocks. Report the mass of resilient padding in the test report along with other information about this test run.

8.2.4 *Fabric Cutting*:

8.2.4.1 First, cut a square of 200 mm by 200 mm.

NOTE 1—Do not cut fabrics on the bias. If the fabric weave is such that the yarns in the two directions do not lie at 90° to each other, do not cut the sample along yarns in both directions, since a skew specimen would result.

8.2.4.2 For cone calorimeter results to be repeatable, fabric for the different replicates must show uniformity. When fabric material is obtained directly from a bolt of cloth, do not cut specimens using closer than 10–12 cm to the selvedge (that is, the finished edge).

NOTE 2—This is because sometimes there are weaving or coating variations that occur closer to the selvedge.

8.2.4.3 To assist in verifying that uniform specimens have been cut, check each set of fabric specimens that has been cut to the 200 mm × 200 mm size for mass. Determine the mass once three replicate pieces have been cut. None of the pieces shall have a mass of more than 105 % of the mean of the three, nor a mass of less than 95 %. If such a difference occurs, check to see if any of the pieces have been cut oversized. Trim them if this is found to be the case. If the cause of variation was not due to oversized pieces, then cut additional fabric pieces and determine the mass.

8.2.4.4 If fabrics cannot be prepared to within the 5 % deviation limit, then note the fabric masses and mass range of the specimen. Continue cutting the fabric for each specimen by cutting it to the shape indicated in Fig. 1. Control all given dimensions according to the tolerances given in the figure (± 0.5 mm). Only essential dimensions are given in this figure. The 95- and 102-mm dimensions must be checked both before and after cutting. When a fabric having thick yarns is cut, stop cutting outside the 102-mm dimension when a yarn is reached.

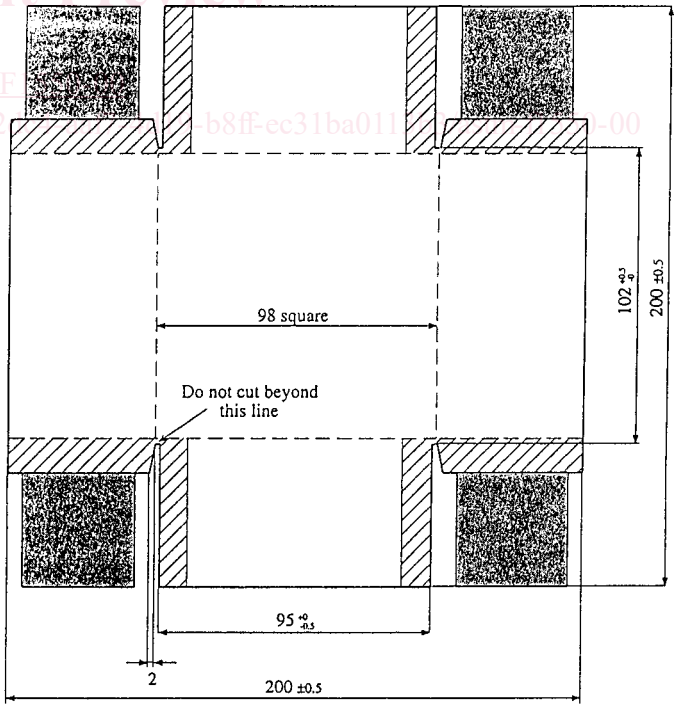

FIG. 1 Fabric Cutting Shape

[8] Commercially available "heavy duty foil" has the appropriate thickness.

Do not cut through the yarn if this will make the dimension smaller than 102 mm.

8.2.5 *Preparing the Fabric Shell*:

8.2.5.1 Assemble the finished shell upside-down upon a forming block. Place the fabric, top-side down, on the table. Place the block on top, making sure that is is well-centered. Bend up the two short sides. Tape each of these sides on to the top of the forming block in the center of the top edge. Bend up the long sides and also tape them to the top of the block. Make sure that the fabric does not slip sideways on the block by checking all four corners of the top face. Ensure that the fabric is snug but not stretched.

8.2.5.2 For sensitive interliners, when paper strips are used, put two strips, forming a cross, under the fabric before placing the forming block on top of it.

NOTE 3—Make the paper strips wider than the tape, but shorter, so that the tape can adhere to the wood block or to itself.

When the fabric is bent up, allow the strips to follow. Secure the paper strip with masking tape to hold it on. Turn the block to stand on one of its short side faces. Using the suitable adhesive, glue down the 10-mm gluing area marked with stripes in Fig. 1 on each corner flap (the area which corresponding to the long side) onto its mating short-side surface. Apply adhesive both to the underneath surface of the flap and to the surface against which it will mate. Use of a 7–8-mm wide brush (for solvent based adhesives) will ensure that the glued area is approximately 10 mm wide. Press down immediately after applying the adhesive or after waiting to dry, as appropriate, according to the instructions of the adhesive manufacturer.

8.2.5.3 The grey area shown in Fig. 1 is used for gripping and stretching the fabric around the corners of the forming block. After applying adhesive to the first two corners, turn the block to rest on the side just-glued and apply adhesive to the other two corners. If necessary, tape over the gripping handles and around the corners in order to secure the fabric in the shape of the forming block (see above), or wrap the block with paper strips prior to sealing with masking tape.

8.2.5.4 Allow the specimen to dry face down for 24 h (do not stack specimens during drying). Be certain to clean up the brush or other utensils used to apply the adhesive. Wipe the solvent and any excess adhesive off the brush with a piece of cloth before gluing the next specimen. After 24 h have elapsed, remove all the pieces of masking tape, and trim off the four flaps down to the indicated offset mark so that only the 10-mm glued-down portion is left. Trim any fabric protruding below the bottom edge of the forming block.

8.2.6 *Preparing the Aluminum Foil*—Cut an over-sized piece of aluminum foil. If the foil has a shiny and a dull side, place the shiny side facing up. The actual specimen is slightly larger than the forming block, depending on the thicknesses of the fabric and interliner (if present). Shape the aluminum foil for the final specimen according to either 8.2.6.1 or 8.2.6.2.

8.2.6.1 Use a fabric-covered forming block, encased with the fabric shell top side up. Place the block on the aluminum foil. Hold the block firmly in place and pull each side of the foil up to create the bottom folds. Form the corners by holding the foil firmly in contact with the corner of the specimen. Stretch the corner of the foil and make a 45° fold at each corner. Finally, pull the corners flat against the two sides of the specimen and pat all sides down flat against the specimen. Fig. 2 illustrates the folds to be made. Make sure that the bottom edges and the corners are crisp, straight, and smooth. Remove the forming block and its encasing fabric shell from the foil cup.

8.2.6.2 Set aside one forming block specifically for shaping the aluminum foil containers. Either prepare another block with dimensions 102 × 102 mm (rather than 98 × 98 mm), or glue or tape cardboard to the sides of a block to create one that is 102 × 102 mm. Then use this new block for shaping the aluminum foil as described in 8.2.6.1.

8.2.7 *Assembling the Shell of Resilient Padding and Fabric*:

8.2.7.1 Remove the forming block from the fabric shell. If bits of adhesive make the fabric stick to the block, use a chemist's spatula or a similar dull, knife-like device to loosen the corners. It is easiest to release the fabric by grabbing along the top edge of the fabric between the thumb and the index finger. Remove any adhesive which may remain stuck to the forming block. Make certain that the blocks of resilient padding are identified and tracked according to their masses, which already have been recorded.

8.2.7.2 Compress the four corners of the selected resilient padding block slightly with the fingers and insert the block into the fabric shell. Make sure that the resilient padding is inserted straight. Check each of the resilient padding block corners to see that they line up exactly at the corners of the fabric shell. Check the top face to see that the block of resilient padding is inserted fully into the shell and that there are no gaps. Also check that the bottom of the resilient padding is neatly lined up with the bottom edge of the fabric. If the specimen construction involves additional padding layers or different padding layers, follow similar steps to ensure that a straight, taut assembly is made.

8.2.7.3 Carefully inspect the specimen. Ensure that there are no buckles, warping, twisting, pulling, etc. The fabric must be

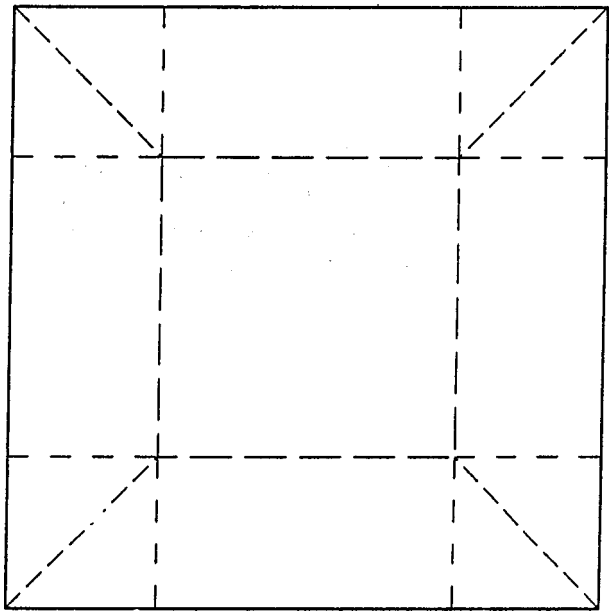

FIG. 2 Folding of Foil

taut and there must not be any air spaces between the fabric and the padding. If any such problems are discovered and cannot be corrected, discard the specimen. Staple each of the four sides as shown in Fig. 3. Inspect the top face of the specimen. None of the four tabs are to overhang at the top of the specimen. If there is excess material there, trim it with scissors. Be certain that no holes are made in the specimen while doing the trimming.

8.2.8 Assemble the specimen and the foil. Put the assembled specimen in the foil cup. Pat the aluminum foil sides down flush against the specimen. Cut the top of the foil to the flush with the top of the specimen. Open up slightly the corners of the aluminum foil and pull the foil top about 20 mm away from the specimen. This will allow good access of air in the conditioning chamber.

8.2.9 *Conditioning*—Place the specimen in the conditioning chamber for 24 h. Condition to moisture equilibrium (constant mass) at an ambient temperature of 23 ± 3°C and a relative humidity of 50 ± 5 %.

8.2.10 *Final Preparation*—Remove the specimen from the conditioning chamber. Check that the specimen is wrinkle-free, smooth and visually completely uniform and symmetrical. Fix or reject if defects are found. Determine the specimen mass with and without the aluminum foil. Pat the aluminum foil sides again down flush against the specimen. Place the specimen on the sample holder. Gently push down on the top of the specimen, pushing against the ceramic fibre blanket. This ensures that the bottom conforms smoothly to the same bottom conditions as well be seen during the testing. The specimen is now ready to be tested.

8.3 *Preparation of Specimens with Multiple Layers and Specialized Constructions*:

8.3.1 The instructions below give additional details for preparation of those constructions that involve more than a single fabric layer and a single resilient padding layer. The instructions also provide for some materials that need specialized preparation techniques.

8.3.2 *Specimens that Use a Separate Interliner Layer*:

8.3.2.1 Specimens that use a separate interliner layer are prepared according to the instructions above but with the following special provisions. For these composites, the forming block is covered twice, first with the interliner then with the fabric, using the following steps. Some interliners are mechanically quite fragile. Avoid tearing them when the masking tape is stripped off. Test the tape to be used first to make sure that it can be smoothly pulled off the interliner without damage.

8.3.2.2 Select an alternate tape or use paper strips if needed.

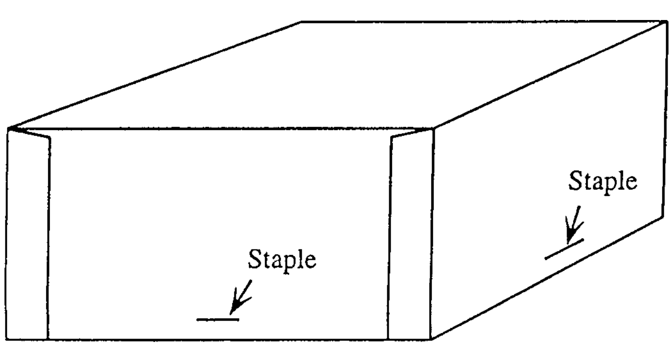

FIG. 3 Assembled Specimen

Cut the interliner using the same method as described for cutting fabrics (in 8.2.4). Glue up the interliner around the forming block using the same instructions as for fabrics (8.2.5). Leave the specimen to dry for 24 h. After 24 h have elapsed, remove all the pieces of masking tape. If there is any interliner protruding below the bottom edge of the forming block, trim such excess off with scissors. The forming block is now covered with a layer of interliner.

8.3.2.3 Once this is done, follow the instructions above for cutting and preparing the fabric. To minimize thickness variations along the completed assembly, when placing the fabric on top of the interlined turn its orientation by 90°. This will make the two sides where fabric flaps are glued not to be lined up with the similar flaps on the interlined but rather so that 2 of the sides of the finished specimen will contain doubled-up areas of fabric flaps and the 2 other sides will contain doubled-up areas of interliner flaps and continue on to 8.2.6.

8.3.3 Specimens that use a polyester fiber topper layer on top of the foam.

8.3.3.1 If a polyester fiber batting layer is present over the top of the foam, the padding assembly is prepared according to 8.3.3.2 or 8.3.3.3.

8.3.3.2 If the uncompressed polyester fiber layer is 20-mm thick or less, compress it to one half of that thickness in the final assembly. The foam block thickness then is to be the difference between 50 mm and one half of the uncompressed thickness of the polyester fiber layer.

8.3.3.3 If the uncompressed polyester fiber layer is greater than 20 mm, cut back the polyester fiber layer to give a 20 mm depth and the preparation continued as above. Place the polyester topper layer on top of the foam block. Use this composite block wherever the general instructions refer to actions to be taken on the "block of resilient padding."

8.3.3.4 During final assembly of the padding inside the fabric, compress the polyester plus foam composite block so as to have a total depth of 50 mm when the assembly is finished.

8.3.4 *Specimens that Use More Than One Padding Layer (except polyester fiber)*—Use any padding layers thinner than 8 mm in their natural thickness. Proportion the thickness of each remaining layer (those ≥8 mm in thickness) so that its relative thickness in the remaining specimen depth (50 mm minus the thin layers) is in the same proportion as is found for those layers in the full-scale furniture article. Once the appropriate layers are prepared according to this instruction, they are used in exactly the same way as is the single foam block that forms the basis of the general instructions above.

8.3.5 *Specimens from Furniture Items of Unusually Thin Construction*:

8.3.5.1 For some furniture items, the total thickness of the entire padding layer is less than 50 mm. Examples include thinly padded chairs and innerspring mattresses. For such items, the padding layer is still tested in a 50-mm depth.

8.3.5.2 To do this requires that two or more layers of padding be stacked together to achieve the required 50-mm depth. When testing cone calorimeter samples that represent known full-scale constructions, clearly identify in the test report what the maximum thickness of padding found in the full-scale article was, when that thickness was less than 50 mm.