701

NFPA 701 Standard Methods of Fire Tests for Flame-Resistant Textiles and Films 1996 Edition

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An International Standards-Making Organization

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Policy Adopted by NFPA Board of Directors on December 3, 1982

The Board of Directors reaffirms that the National Fire Protection Association recognizes that the toxicity of the products of combustion is an important factor in the loss of life from fire. NFPA has dealt with that subject in its technical committee documents for many years.

There is a concern that the growing use of synthetic materials may produce more or additional toxic products of combustion in a fire environment. The Board has, therefore, asked all NFPA technical committees to review the documents for which they are responsible to be sure that the documents respond to this current concern. To assist the committees in meeting this request, the Board has appointed an advisory committee to provide specific guidance to the technical committees on questions relating to assessing the hazards of the products of combustion.

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NFPA 701

Standard Methods of Fire Tests for

Flame-Resistant Textiles and Films

1996 Edition

This edition of NFPA 701, *Standard Methods of Fire Tests for Flame-Resistant Textiles and Films*, was prepared by the Technical Committee on Fire Tests and acted on by the National Fire Protection Association, Inc., at its Fall Meeting held November 13-15, 1995, in Chicago, IL. It was issued by the Standards Council on January 12, 1996, with an effective date of February 2, 1996, and supersedes all previous editions.

This edition of NFPA 701 was approved as an American National Standard on February 2, 1996.

Origin and Development of NFPA 701

Requirements for flameproofing of textiles were adopted by the NFPA on recommendation of the Committee on Fireproofing and Preservative Treatments in 1938. These requirements were amended in 1939, 1940, 1941, and 1951. This standard is now under the jurisdiction of the NFPA Technical Committee on Fire Tests; the 1966 edition, which was an extensive revision of the previous edition, was prepared by that committee, as were the 1968, 1969, 1975, 1976, and 1977 editions.

The 1989 edition was a complete rewrite with significant changes to the small-scale test.

The 1996 edition represents a significant departure from earlier editions, as it provides a new test for single-layer and multilayer fabric assemblies but maintains the large-scale test for multilayer assemblies involving coated fabric blackout linings. This new test was developed to address the problem presented by multilayer assemblies that could not be addressed by the current test procedures. The new Test 1 has been proven through experience to be an adequate predictor of the behavior of single-layer and multilayer assemblies.

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Committee Scope: This Committee shall have primary responsibility for documents on fire testing procedures when such standards are not available; for reviewing existing fire test standards and recommending appropriate action to NFPA; for recommending the application of and advising on the interpretation of acceptable test standards for fire problems of concern to NFPA technical committees and members; and for acting in a liaison capacity between NFPA and the committees of other organizations writing fire test standards. This committee does not cover fire tests that are used to evaluate extinguishing agents, devices, or systems.

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates explanatory material on that paragraph in Appendix A.

Information on referenced publications can be found in Chapter 15 and Appendix E.

Chapter 1 Introduction

1-1 Purpose of Test 1 and Test 2.

1-1.1 It is the purpose of these test methods to assess the propagation of flame beyond the area exposed to the ignition source.

1-1.2 These test methods do not indicate whether the material tested resists the propagation of flame under more severe exposure conditions or where used in a manner that differs substantially from the test conditions.

1-1.3 Test 1 differentiates fabrics that do not spread flame extensively from those that do burn rapidly and extensively.

1-1.4 Test 1 provides a procedure for assessing the response of fabrics both individually and in multilayer composites used as curtains, draperies, or other window treatments when exposed to a moderate flame while suspended in a vertical configuration.

1-1.5 Test 2 provides a comparison among materials using a moderate size ignition flame.

1-1.6 Flame-resistant requirements shall not be dependent on the type of treatment; however, where durability to cleaning or weathering is claimed, the fabric or material shall be tested for flame resistance as produced and after being subjected to the applicable cleaning or exposure procedures. (*See Chapter 13.*)

1-1.7 Where materials are to be applied to surfaces of buildings or backing materials as interior finishes for use in buildings, the test shall be conducted and the material classified in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials.*

1-2 Scopes.

1-2.1 Test Method 1.

1-2.1.1 This test method shall apply to fabrics (except for vinyl-coated fabric blackout linings) or other materials used in curtains, draperies, or other window treatments.

1-2.1.2 This test method shall apply to single-layer fabrics and multilayer curtain and drapery assemblies (except for vinyl-coated fabric blackout linings) in which the layers are fastened together by sewing or other means for holding portions of the assembly in intimate contact.

1-2.1.3 For the purposes of this test method, where the terms curtains, draperies, or other window treatments are used, they also shall include, but shall not be limited to, the following items:

(a) Window curtains;
(b) Stage or theater curtains;
(c) Vertical folding shades;
(d) Roll-type window shades;
(e) Hospital privacy curtains;
(f) Window draperies;
(g) Fabric vertical shades or blinds;
(h) Horizontal folding shades;
(i) Swags;
(j) Fabric horizontal shades or blinds.

1-2.1.4 This test method also shall apply to the following textile items:

(a) Table skirts;
(b) Table linens;
(c) Display booth separators;
(d) Textile wall hangings.

1-2.1.5 This test method shall not apply to fabrics or composites greater than 700 g/m^2 (21 oz/yd^2).

1-2.2 Test Method 2.

1-2.2.1 This test method shall be used for testing coated fabric blackout linings and lined draperies using a coated fabric blackout lining.

1-2.2.2 This test method shall be used for testing plastic films, with or without reinforcement or backing, where used for decorative or other purposes inside a building or as temporary or permanent enclosures for buildings under construction.

1-2.2.3 This test method shall apply to fabrics used in the assembly of awnings, tents, tarps, and similar architectural fabric structures and banners.

1-2.2.4 This test method (flat specimen configuration) shall be used for fabrics and films, with or without reinforcing or backing, that weigh in excess of 700 g/m^2 (21 oz/yd^2).

Chapter 2 Test 1

2-1 General.

2-1.1 The specimens shall be suspended from a pin bar.

2-1.2 A weighed specimen consisting of one or more layers of fabric shall be suspended vertically from a pin bar near the top rear of an open-face test cabinet. A specified gas flame shall be applied to the center of the lower edge of the specimen for 45 seconds and then withdrawn. The specimen shall be allowed to burn until the flame self-extinguishes and there is no further specimen damage. The specimen then shall be removed from the pin bar and weighed again. The percent weight loss shall be determined and used as a measure of total flamespread and specimen damage.

2-2 Conditioning Oven. A forced draft oven, capable of maintaining a temperature of 105°C ± 3°C (220°F ± 5°F), shall be used to condition the test specimens prior to testing.

2-3 Hood. A standard laboratory hood [minimum 820 mm (32 in.) wide by 750 mm (30 in.) high by 630 mm (25 in.) deep] or other suitable enclosure shall be used and shall provide a draft-free environment around an open-face test chamber. The hood or other enclosure shall be equipped with an exhaust fan for exhausting the smoke as provided in 5-3.2.

2-4 Test Chamber, Specimen-Mounting Pin Bar, and Gas Burner.

2-4.1 An open-face test chamber is shown in Figure 2-4.1(a). The test chamber shall be constructed in accordance with Figure 2-4.1(a) using 12-mm (0.5-in.) thick marinite mineral board. All interior surfaces of the cabinet shall be painted with a flat black paint that withstands the heating that occurs in the cabinet. Figure 2-4.1(b) shows a sketch of the cabinet with the burner and specimen in place.

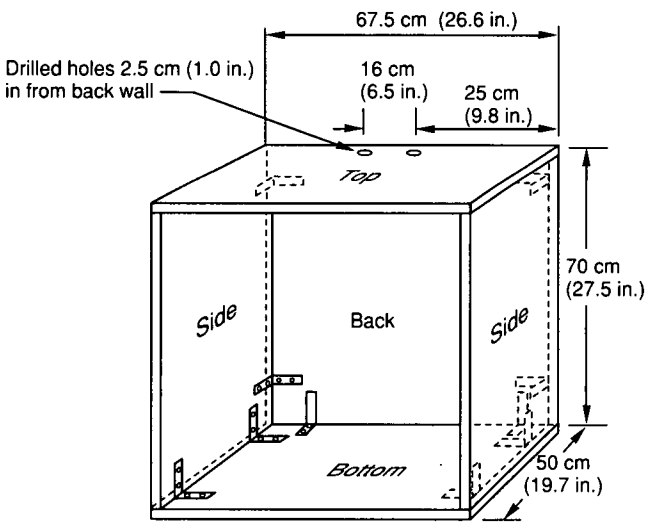

Figure 2-4.1(a) Test cabinet for Test 1.

2-4.2* The pin bar for mounting the specimen shall be a 9-mm^2 (0.36-in.^{2}) stainless steel bar, 190 mm (7.5 in.) in length, with steel pins 0.7 mm (0.027 in.) in diameter and 11 mm (0.43 in.) long, mounted at distances of 37 mm, 66 mm, 95 mm, 124 mm, and 153 mm (1.45 in., 2.60 in., 3.75 in., 4.90 in., and 6.05 in.) from each end of the bar. (*See Appendix A for information on a suitable alternate test cabinet.*)

2-4.3* A Meeker (Fisher) burner shall be used as the ignition source.

2-5 Gas and Control System.

2-5.1* Methane gas that is at least 97 percent pure shall be used for the burner fuel. The gas shall be contained in a cylinder equipped with a pressure-reducing valve and gauges to allow maintenance of a pressure of 17.5 kPa ± 2.0 kPa (2.5 psi ± 0.25 psi) (132 mm Hg ± 13 mm Hg) at the flow gauge.

2-5.2* A gas flow gauge with a flow control valve shall be used to measure and control the gas flow rate.

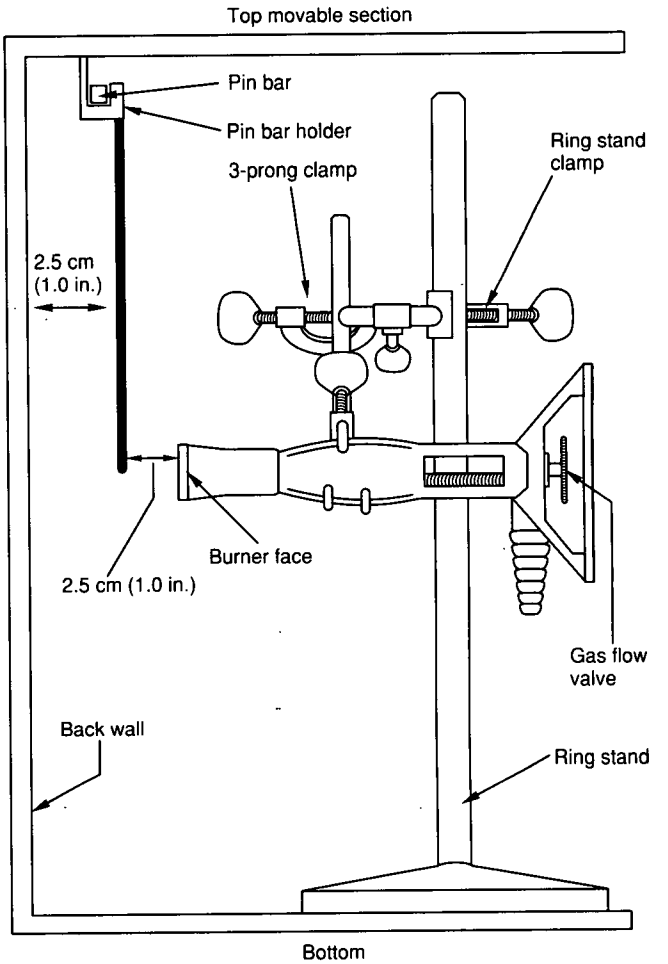

Figure 2-4.1(b) Schematic of burner and specimen placement for Test 1.

2-5.3 The gas tank, flow gauge, control valves, and burner shall be connected as shown in Figure 2-5.3. Hose or tubing with at least a 5-mm (0.2-in.) bore shall be used. The control valve at the tank shall not be used to control the flow through the flow gauge. The flow valve at the tank shall be fully open during the test.

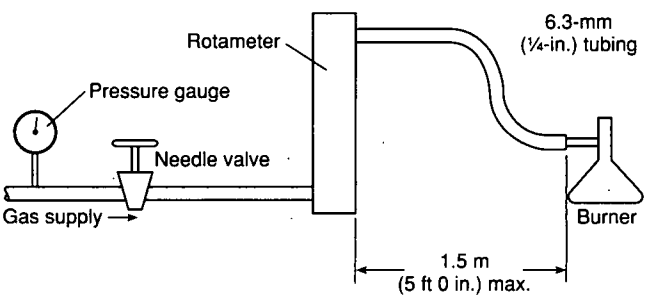

Figure 2-5.3 Gas line feed arrangement to burner.

2-6 Mounting Jig. A mounting jig, as described in Appendix B, shall be used for mounting specimens to the pin bar in a uniform and safe manner.

2-7 Timer. A stopwatch or other timing device shall be used to measure time to the nearest 0.2 second.

2-8 Balance. A balance having a capacity of at least 100 g (3.53 oz) and a resolution of 0.1 g (3.5×10^{-3} oz) shall be used to weigh the specimen.

2-9 Ruler. A ruler, marked in 1-mm ($^1/_{32}$-in.) increments, shall be used to measure the burner flame height and specimen dimensions.

2-10* Wire Brush. A brush manufactured from bronze wire shall be used for removing ash and char debris from the test specimen at the conclusion of each test and before the post-test weighing.

Chapter 3 Calibration and Standardization for Test 1

3-1 General. At the start of each series of tests, the air vents at the base of the burner shall be fully open and the gas flow set for a flow gauge scale reading of 70 ± 2 using the flow control valve on the gauge. This corresponds to an airflow of 895 ml/min ± 25 ml/min (5.26×10^{-10} ft^3/sec ± 1.47×10^{-15} ft^3/sec) and a methane flow of 1205 ml/min ± 35 ml/min (7.1×10^{-4} ft^3/sec ± 2.0×10^{-5} ft^3/sec). At the same time, the pressure gauge shall read 17.5 kPa ± 2.0 kPa (2.5 psi ± 0.25 psi) (132 mm Hg ± 13 mm Hg). This shall provide a flame height of 100 mm ± 10 mm (4.0 in. ± 0.4 in.) with the burner in a vertical position. The flow control valve on the burner shall be fully open.

Chapter 4 Specimens and Conditioning for Test 1

4-1 Test Specimens.

4-1.1 Ten individual test specimens shall be cut from a single piece of the material to be evaluated to a size of 150 mm ± 5 mm × 400 mm ± 5 mm (5.90 in. ± 0.20 in. × 15.75 in. ± 0.20 in.), with the length parallel to the lengthwise direction of the material. These 10 specimens constitute a sample. Specimens shall not be taken nearer the selvage than $^1/_{10}$ of the full width of the fabric.

4-1.2 For multilayer assemblies, the layers shall be sewn together as shown in Figure 4-1.2 using a plain stitch with 2.5 stitches/cm ± 0.25 stitch/cm (6.4 stitches/in. ± 0.6 stitch/in.). A No. 40 polyester/cotton sewing thread shall be used. The layers of the multilayer assembly shall be sewn along all four edges at a distance of 5 mm ± 1 mm (0.2 in. ± 0.04 in.) from the edge. A fifth seam shall be sewn along the center of the assembly in the lengthwise direction. This center seam shall extend the full length of the specimen.

4-1.3 Each specimen shall be numbered and weighed to the nearest 0.1 g (3.5×10^{-3} oz) before conditioning. The weight of each specimen shall be recorded.

4-2 Conditioning. The specimens shall be placed in a forced draft oven to allow free circulation of air around the specimens. The specimens shall be dried for at least 30 minutes at 105°C ± 3°C (220°F ± 5°F).

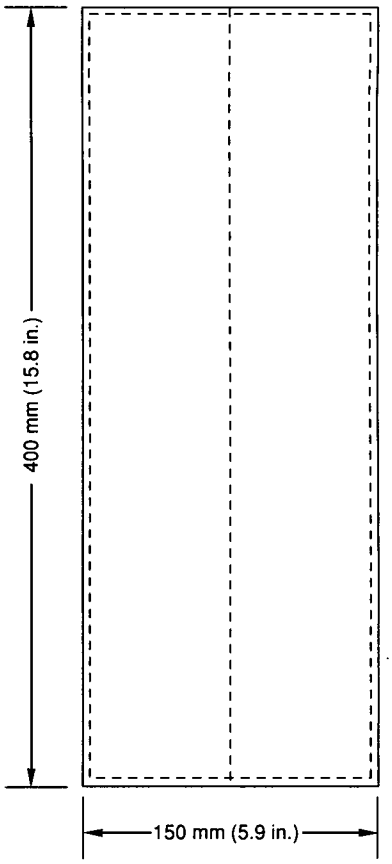

Figure 4-1.2 Multilayer specimen for Test 1.

Chapter 5 Test Procedure for Test 1

5-1 Mounting of Test Specimens.

5-1.1 After conditioning, the specimen shall be attached to the pin bar with the top of the specimen centered on the bar. The pins shall be 5 mm ± 1 mm (0.20 in. ± 0.04 in.) from the top edge of the specimen. The mounting jig described in Appendix B shall be used. The specimen shall be placed on the pin bar so that the face or the layer intended to face the wall or window during normal use faces the pin bar.

5-1.2 The pin bar shall be mounted on the support hanger located at the back of the ceiling of the test chamber. The face, which in normal use is intended to face the wall or window, shall face the back of the test chamber. When the pin bar and hanger are placed, the side of the specimen facing the back wall of the test chamber shall be 25 mm ± 2 mm (1.0 in. ± 0.08 in.) from the wall surface.

5-2 Burner Placement and Preparation.

5-2.1 The burner shall be placed so that it is 25 mm ± 2 mm (1.0 in. ± 0.08 in.) from the face of the specimen and with the center axis of the burner horizontal and in line with the bottom of the center seam in the specimen. Position adjustments shall be permitted to be made by moving the support base and by adjusting the height and angle of the burner.

5-2.2 The exhaust fan shall be turned on.

5-3 Conducting the Test.

5-3.1 The test shall be initiated within 2 minutes after removing the specimen from the forced draft oven. The gas shall be turned full on at the burner control valve. The gas shall be flowed for 20 sec ± 1 sec. The gas then shall be ignited. The flame shall burn for 45 sec ± 1 sec. After the 45-second exposure, the burner shall be turned on its mount so that its center axis is parallel to the plane of the specimen, and then the gas shall be turned off using the control valve on the burner. The gas flow rate shall be controlled only by the valve on the flow gauge. The valve on the burner shall be turned off completely and then turned on completely for the duration of the test exposure, and then it shall be closed completely at the end of the 45-second exposure time.

5-3.2 The exhaust fan shall remain on throughout the test procedure. The front of the hood shall be closed after the burner is turned off and pulled away from the specimen to remove the smoke produced by the burning specimen.

5-3.3 The afterflame time of the specimen (time of burning of the specimen after the gas flow is turned off) and the time of burning of material that falls to the bottom of the chamber shall be measured and recorded. Observations such as, but not limited to, the type, amount, color, density, and odor of smoke produced, the vigorousness of burning, and the dripping of molten material also shall be recorded.

5-3.4 The pin bar and specimen shall be removed from the hanger.

5-3.5 The wire brush shall be used to remove ash and char from the specimen.

5-3.6 The specimen shall be removed from the pin bar.

5-3.7 The portion of the specimen removed from the pin bar shall be weighed to the nearest 0.1 g (3.5×10^{-3}) and the weight shall be recorded. Any material that has fallen away from the specimen shall not be weighed.

Chapter 6 Calculation of Results for Test 1

6-1 Calculation of Percent Weight Loss.

6-1.1 The percent weight loss of each specimen shall be determined from the following equation:

$$\frac{\text{(Weight before test} - \text{Weight after test)}}{\text{(Weight before test)}} \times 100 = \text{Percent weight loss}$$

The percent weight loss shall be recorded.

6-1.2 The mean percent weight loss and the standard deviation for the sample consisting of 10 specimens shall be calculated.

6-1.3 Where the percent weight loss of any individual specimen exceeds the mean value plus three standard deviations, the test shall be repeated on another sample of 10 specimens. The mean percent weight loss and standard deviation for the second set of 10 specimens shall be calculated.

Chapter 7 Flame Resistance Performance Criteria for Test 1

7-1 Performance Criteria.

7-1.1 Where fragments or residues of specimens that fall to the floor of the test chamber continue to burn for more than an average of 2 seconds per specimen for the sample of 10 specimens, the material shall be recorded as failing Test 1.

7-1.2 Where the average weight loss of the 10 specimens in a sample is greater than 40 percent, the material shall be recorded as failing this test.

7-1.3 Where the percent weight loss of any individual specimen in the second set of specimens exceeds the mean value of the second set plus three standard deviations calculated for the second set, the material shall be recorded as failing this test.

7-1.4 Where the specimens do not demonstrate performance in accordance with any of the conditions indicated in 7-1.1 through 7-1.3, the material shall be recorded as passing this test and shall be designated as flame resistant.

Chapter 8 General Requirements for Test 2

8-1 General.

8-1.1 This test method provides a comparison among materials using a moderate size igniting flame.

8-1.2 This large-scale test exposes a 1.2-m (47.25-in.) long specimen to a 280-mm ± 12 mm (11.0-in. ± 0.5 in.) igniting flame inside a three-sided test cabinet that is 305 mm^2 (12 $in.^2$) and 2.13 m (84 in.) high.

Chapter 9 Test Apparatus and Materials for Test 2

9-1 Conditioning Oven.

9-1.1 A forced draft oven shall be used to condition test specimens prior to testing.

9-1.1.1 The interior of the oven shall provide free airflow around each specimen it contains.

9-1.1.2 An oven having variable temperature control capable of maintaining its interior at a temperature of 105°C ± 3°C (220°F ± 5°F) shall be used.

9-2 Test Enclosure.

9-2.1 The test shall be conducted in a three-sided metal stack with an area of 305 mm^2 (12 $in.^2$) and a height of 2.13 m (84.0 in.) [*see Figure 9-2.1(a)*], with details as follows:

(a) The stack shall be supported 305 mm (12 in.) above the floor by legs and shall be open at the top and bottom.

(b) The stack shall have one open side to allow for free access of non-oxygen-depleted air to the exposed specimen during the test.

(c) The stack shall have a means for hanging the specimen as follows:

Top Specimen Rod. A steel rod 1.5 mm or 3.0 mm (0.06 in. or 0.12 in.) in diameter and 330 mm (13 in.) long, sharpened to a point at one end. The stack shall have holes of 4 mm on both sides aligned horizontally and located 1.19 m (46.8 in.) above the bottom edge of the cabinet for the location of the top specimen rod.

Bottom Specimen Rod. A steel rod 1.5 mm (0.06 in.) in diameter, 255 mm (10.0 in.) long, sharpened to a point at one end.

Vertical Guide Wires. Soft steel wire shall be used to make a pair of vertical guide wires on each side of the stack spaced 100 mm (4 in.) to the right and left of the vertical center of the stack [each pair separated by 200 mm (8 in.)]. The wires of each pair shall be 25 mm (1 in.) apart (front to back, in the cabinet).

The vertical guide wires shall be mounted using rods 6 mm (0.25 in.) in diameter fixed horizontally at the top and bottom of the stack. [*See Figure 9-2.1(g).*]

(d) A glass fiber fabric baffle shall be installed in the upper portion of the test cabinet as follows:

1.* A piece of glass fiber fabric measuring 1 m × 125 mm (39.4 in. × 4.9 in.) shall be cut.

2. A 40-mm (1.6-in.) hem shall be sewn on each end of the fabric using a glass sewing thread.

3. A 3-mm × 330-mm (0.12-in. × 13-in.) rod shall be inserted through the hem at one end and through holes [4 mm (0.158 in.)] in the top middle of the two opposite sides of the cabinet. These holes shall be centered 10 mm ± 1 mm (0.4 in. ± 0.04 in.) below the top edge of the cabinet and midway between the front and back of the cabinet.

4. A 3-mm × 330-mm (0.12-in. × 13-in.) rod shall be inserted through the bottom hem of the glass fabric and also through the slotted holes that are in the opposite sides of the test cabinet centered 930 mm ± 2 mm (36.6 in. ± 0.08 in.) below the top of the cabinet. These slotted holes shall be 4 mm × 25 mm (0.16 in. × 1.0 in.), rounded at each end.

9-2.2 The stack shall be located in a room, chamber, or hood where the temperature is 15°C ± 10°C (60°F ± 18°F) and the relative humidity does not exceed 70 percent.

9-2.3 The test chamber shall be free of drafts that affect the stability of the flame.

9-2.4 Figures 9-2.1(a) through (f) shall be used for details regarding enclosure construction and facilities for mounting both flat and folded test specimens.

9-3 Restraining Clamps. See 11-2.3.

9-4* Gas Burner. A bunsen burner of 9.5-mm (0.375-in.) tube diameter shall be used for the ignition source. If the burner is equipped with a gas flow controlling valve, the valve shall be open fully in order to prevent restriction of gas flow. The art vents shall be kept closed and sealed.

9-4.1 The burner shall be fixed in a position so that the barrel is at a 25-degree angle with the vertical, with the upper tip of the burner located 100 mm (4 in.) below the bottom edge of the test specimen.

9-4.2 The gas supply to the burner shall be at least 97 percent pure methane or manufactured or natural gas having a heat value of 25 × 10^6 J/m^3 to 31 × 10^6 J/m^3 (800 Btu/ft^3 to 1000 Btu/ft^3).

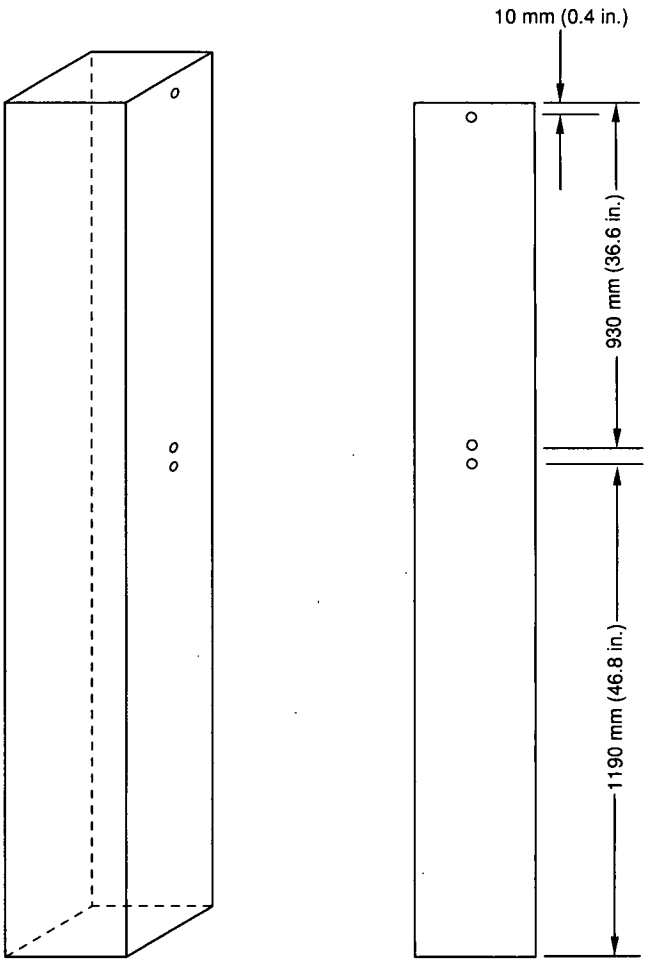

Figure 9-2.1(a) Orthographic view of test cabinet for Test 2.

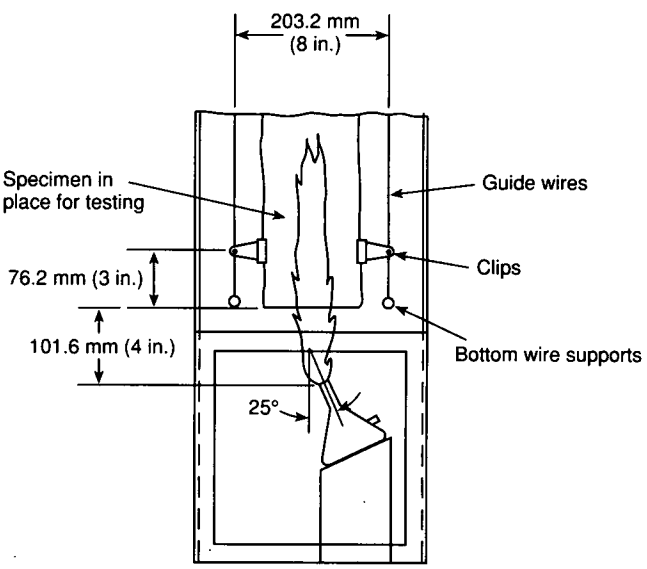

Figure 9-2.1(b) View of inside at bottom of cabinet.

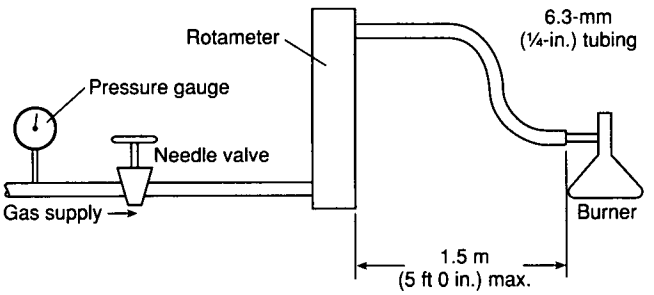

Figure 9-2.1(c) Gas line feed arrangement to burner.

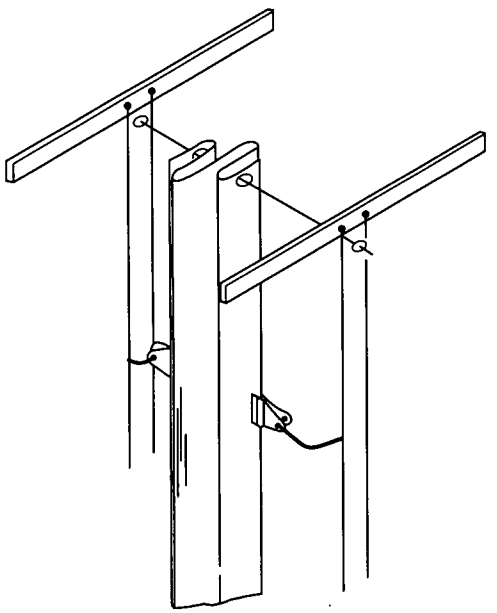

Figure 9-2.1(d) Test sample in folds.

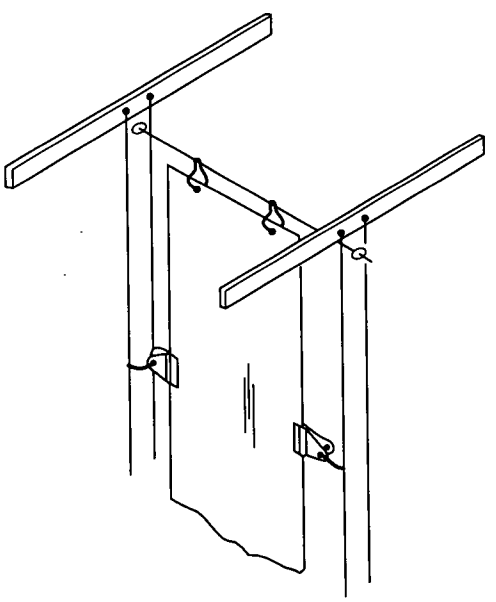

Figure 9-2.1(e) Test sample flat sheet.

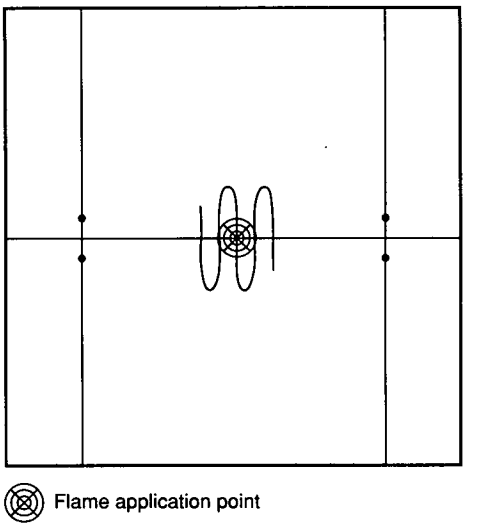

Figure 9-2.1(f) Bottom view of folded sample.

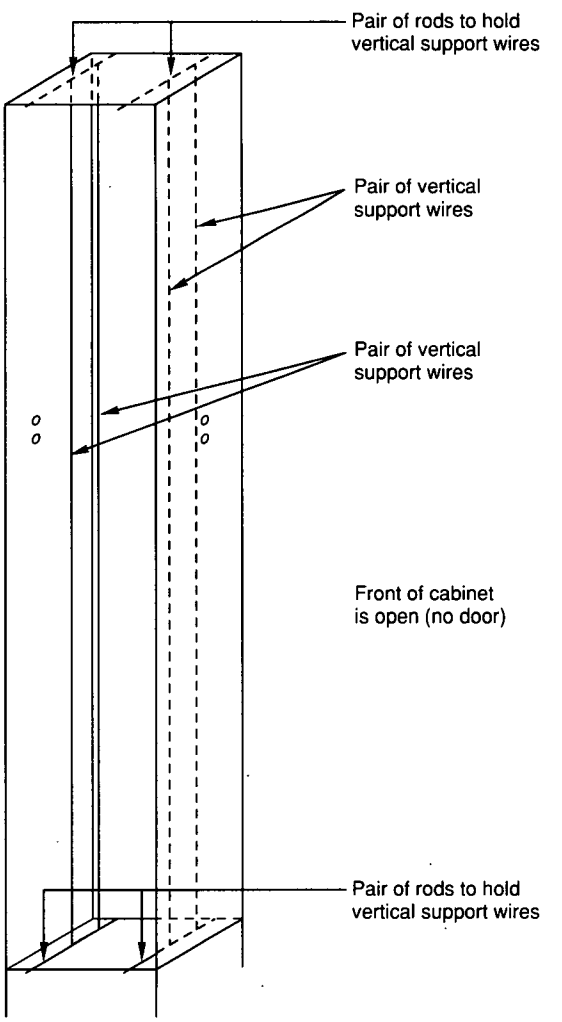

Figure 9-2.1(g) Vertical guide support.

9-4.3 A needle valve for gas flow control shall be used followed by a rotameter in the gas line leading to the burner. The upper limit of the rotameter shall be 150 L/hr to 300 L/hr (1.47×10^{-3} ft^3/sec to 2.9×10^{-3} ft^3/sec). A pressure gauge shall be located between the gas supply and the needle valve used for controlling the gas flow. The gas lines from the needle valve to the rotameter and from the rotameter to the burner shall have a bore of at least 6 mm (0.24 in.) and shall not exceed a total length of 1.5 m (60 in.). [*See Figure 9-2.1(c).*]

9-5 Timer. A stopwatch or other timing device that measures to an accuracy of 0.5 second shall be used for determining afterflame of burning specimens and the flame time of portions of residues that break away or drip from the test specimen and continue to flame after reaching the floor of the test chamber.

9-6 Ruler. A ruler marked in 1-mm ($^1/_{32}$-in.) increments shall be used to measure the burner flame height and specimen dimensions.

Chapter 10 Specimens and Conditioning for Test 2

10-1 Test Specimens.

10-1.1 Selvages shall be removed from the material to be evaluated before cutting and conditioning specimens. The test specimens shall be taken from widely separated and symmetrically located sections over the entire area of the material. The specimens shall be cut on their long dimension in the lengthwise direction of the material.

10-1.2 For conducting flame tests of flat sheet materials, at least 10 specimens, 125 mm × 1.20 m ± 25 mm (4.9 in. × 47.25 in. ± 1.0 in.) shall be used. Only those specimens that cannot be folded shall be tested in the flat configuration.

10-1.3 For conducting flame tests of materials hung in folds, at least four specimens, 610 mm ± 25 mm × 1.20 m ± 25 mm (24.0 in. ± 1.0 in. × 47.25 in. ± 1.0 in.), shall be used. Each specimen shall be folded longitudinally to form four folds so that the segment of material on each side of a fold uniformly measures 125 mm ± 20 mm (4.9 in. ± 0.8 in.) in width over the length of the specimen. [*See Figures 9-2.1(d) and (f).*]

10-1.4 For multilayer assemblies (either flat or folded), the layers shall be sewn together as shown in Figure 10-1.4 using a plain stitch with 2.5 stitches/cm ± 0.25 stitch/cm (6.4 stitches/in. ± 0.6 stitch/in.). A No. 40 polyester/cotton sewing thread shall be used. The layers of the multilayer assembly shall be sewn along all four edges at a distance of 5 mm ± 1 mm (0.2 in. ± 0.04 in.) from the edge. A fifth seam shall be sewn along the center of the assembly in the lengthwise direction. This center seam shall extend the full length of the specimen. The seam shall be within 10 mm (0.4 in.) of the center of the specimen and shall continue for a distance within 300 mm (12 in.) of the lower end of the specimen.

10-2 Conditioning of Test Specimens.

10-2.1 The test specimens shall be conditioned in an oven at a temperature of 105°C ± 3°C (220°F ± 5°F) for not less than 1 hour nor more than 3 hours before testing.

10-2.2 Each specimen shall be removed from the oven no earlier than 2 minutes before igniting the gas burner.

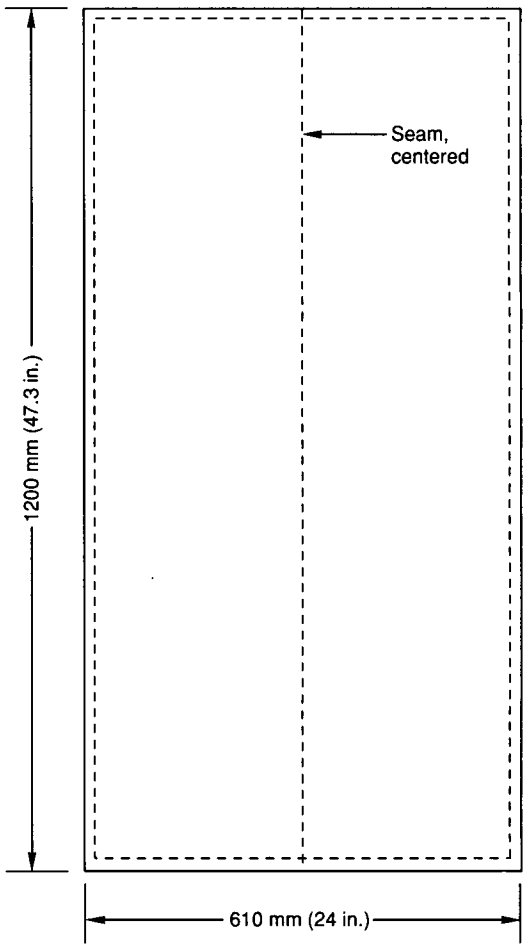

Figure 10-1.4 Multilayer specimen for Test 2.

Chapter 11 Flame Test Procedures for Test 2

11-1 Mounting of Test Specimens.

11-1.1 The 330-mm (13-in.) steel mounting rod shall be threaded through the specimen so that the folded or flat configuration, as appropriate, is maintained. The rod shall be threaded through the specimen 15 mm ± 5 mm (0.6 in. ± 0.2 in.) below the top edge of the test specimen.

11-1.1.1 The folded specimens shall be suspended vertically with the edges of the two center folds facing the front of the stack. The folds shall be spread 12 mm ± 3 mm (0.5 in. ± 0.12 in.) apart by means of the top support rod and the 1.5-mm × 255-mm (0.06-in. × 10-in.) sharpened rod shall be installed halfway down the length of the specimen to hold the folds in place. The bottom of the center portion of the section between the two middle folds shall be 100 mm ± 10 mm (4.0 in. ± 0.4 in.) above the bunsen burner.

11-1.1.2 The flat specimens shall be suspended vertically in the stack with their full width facing the front of the stack so that the center of the bottom of the specimen is located 100 mm ± 10 mm (4.0 in. ± 0.4 in.) above the bunsen burner.

11-1.2 Test specimens shall be restrained laterally at the midpoint of their length and within 75 mm (3 in.) of the bottom edge by bulldog clips and lightweight chains attached to the vertical guide wires.

11-1.3 Figures 9-2.1(d) through (f) shall be used for details for mounting test specimens.

11-2 Conducting the Flame Test.

11-2.1 The gas burner shall be ignited. The gas pressure shall be 17.5 kPa ± 2.0 kPa (2.5 psi ± 0.25 psi) with a flow rate of 113 L/hr ± 3 L/hr (1.1×10^{-3} ft^3/sec ± 2.9×10^{-5} ft^3/sec).

11-2.2 The burner air inlets shall be sealed with vinyl electrical adhesive tape to prevent the entrance of air, and the gas shall be adjusted to produce a 280-mm ± 12 mm (11-in. ± 0.5 in.) flame.

11-2.3 The position of the specimen relative to the test flame shall be maintained by using bulldog clips attached to the edges of the specimen and the vertical guide wires with lightweight chains. These clips shall be attached to the edges of the specimen at the midpoint of the specimen's length.

11-2.4 The test flame shall be applied to the specimen for 2 minutes and then shall be withdrawn.

The flame shall be applied at an angle of 25 degrees from the vertical with the burner opening 100 mm (4 in.) below the edge of the specimen and within 20 mm (0.8 in.) of the middle of the width of the lower edge of the specimen in a single sheet, or at the middle segment of folded specimens. [*See Figure 9-2.1(f).*]

11-2.5 The duration of flaming combustion of material that drops to the floor of the test chamber shall be measured to the nearest 0.5 second and recorded.

11-2.6 The duration of burning of the specimen after the igniting flame has been removed shall be measured to the nearest 0.5 second and recorded.

11-2.7 After all flaming has ceased, the test cabinet and room shall be purged prior to the next test.

11-3 Measurement of Length of Char. The length of the char after all flaming and afterglow on the specimen has ceased shall be determined. The length of char shall be defined as the original length of the specimen minus the distance from the top edge of the specimen to the horizontal line above which all material is intact.

Chapter 12 Flame Resistance Performance Criteria for Test 2

12-1 Performance Criteria.

12-1.1 Where any specimen continues flaming for more than 2 seconds after the test flame is removed from contact with the specimen, the material shall be recorded as failing the test. (*See Section 12-2.*)

12-1.2 Where the length of char of any individual folded specimen exceeds 1050 mm (41.34 in.), the material shall be recorded as failing the test. (*See Section 12-2.*)

12-1.3 Where the char length of any single flat specimen exceeds 435 mm (40.76 in.), the material shall be recorded as failing the test. (*See Section 12-2.*)

12-1.4 Where at any time during or after the application of the test flame any portions or residues of the material being tested break or drip from the specimen and fall to the floor of the test apparatus and continue burning for more than 2 seconds after reaching the floor of the test apparatus, the material shall be recorded as failing the test. (*See Section 12-2.*)

12-2 Retest.

12-2.1 In the event that only one of the four folded specimens meets the criteria of Section 12-1, two new specimens cut in the same direction as those that failed shall be tested. If both of the new specimens fail to meet the criteria, the material shall be recorded as passing this test and shall be designated as flame resistant.

12-2.2 In the event that only one of the 10 flat specimens meets the above criteria, five new specimens cut in the same direction as the one that failed shall be tested. If all five of the new specimens fail to meet the criteria, the material shall be recorded as passing this test and shall be designated as flame resistant.

Chapter 13 Cleaning Procedures

13-1 General. Where a manufacturer claims that the material tested in accordance with this method retains its flame resistance after cleaning or weathering, the material also shall be tested after it has been subjected to the exposure conditions specified in this section of the test method.

13-2 Application. Each fabric shall be subjected to those exposure conditions that are applicable to its intended use (dry cleaning, laundering, or other exposure to water). Each material or assembly shall meet the flame resistance requirements of Chapters 7 and 12 after passing through the appropriate exposure cycles.

13-3 Accelerated Dry Cleaning.

13-3.1 Where the material to be tested is intended to be refurbished by dry cleaning, the material shall be subjected to three full cycles of one of the following dry-cleaning procedures:

(a) A dry-cleaning procedure specified by the manufacturer or finisher for the routine care of the material. If such care instructions are provided by the manufacturer, they shall be used; or

(b) Conventional commercial dry cleaning using either perchloroethylene or Stoddard solvent as the cleaning medium.

13-3.2 Test specimens shall be cut from the dry-cleaned material for testing.

13-3.3 The specimens shall be conditioned before testing.

13-4 Accelerated Laundering.

13-4.1 Where the material to be tested is intended to be refurbished by laundering, the material shall be subjected to five full cycles of one of the following laundering procedures:

(a) A laundering procedure specified by the manufacturer or finisher for the routine care of the material;

(b) Conventional commercial laundering; or

(c) The home laundering procedure specified in the AATCC Technical Manual, *Standard Laboratory Practice for Home Laundering Fabrics Prior to Flammability Testing to Differentiate Between Durable and Non-Durable Finishes.*

13-4.2 Test specimens cut from laundered material shall be used for testing.

13-4.3 The specimens shall be conditioned before testing.

13-5 Accelerated Water Leaching.

13-5.1 Where the material is expected to be suitable for use outdoors, the material shall be immersed totally in a vessel containing tap water at room temperature (20°C ± 5°C) (68°F ± 9°F) for not less than 72 hours. A vessel with a capacity of at least 15.1 L (4 gal) shall be used.

13-5.2 The water shall be drained from the vessel at 24-hour intervals during the immersion period. After all water has drained from the vessel, it shall be refilled as done initially.

13-5.3 At the conclusion of the immersion period, the sample shall be removed from the vessel and dried at room temperature.

13-5.4 Test specimens cut from leached material shall be used for testing.

13-5.5 The specimens shall be conditioned before testing.

13-5.6 Where the material is subjected to the accelerated laundering prescribed in Section 13-4, this leaching procedure shall not be required.

13-6 Accelerated Weathering.

13-6.1 Where limitations imposed by the weathering equipment make it possible to expose only the specimen for Test 1, the following procedure then shall be performed:

(a) The specimens for Test 1 shall be cut before the accelerated weathering procedure is performed.

(b) The specimens shall be exposed for 100 hours using the apparatus and procedure specified in AATCC Test Method 111A, *Weather Resistance: Sunshine Arc Lamp Exposure with Wetting.*

(c) The specimens shall be conditioned before testing.

Chapter 14 Reporting

14-1 General. The recorded results shall be reported along with the description of the materials tested, test conditions, and the accelerated refurbishing or weathering treatments used (if any).

14-2 Material Description.

14-2.1 The composition and form of the material that was tested shall be described. The description shall include the manner in which the material was assembled. Where flame retardants have been added, they shall be described along with the method of application. The weight and construction of the material in the description shall be included.

14-2.2 The intended application of the material or assembly shall be included, where known.

14-3 Test Conditions. The test used and the test conditions shall be described.

14-4 Refurbishing or Weathering Conditions. Where any refurbishing or accelerated weathering procedures were applied to the sample, the procedures shall be described along with the number of cycles used.

14-5 Test Results. The results from individual specimens as well as the sample average for the following measurements and observations shall be reported:

(a) The time of burning for any material that falls to the bottom of the test chamber to the nearest 0.5 second;

(b) The mass of each specimen (to the nearest g) before and after exposure to the ignition flame (Test 1);

(c) The char length to the nearest 3 mm (0.12 in.) (Test 2);

(d) The afterflame time to the nearest 0.5 second (Test 2);

(e) Any unusual behavior of specimens and other observations.

14-6 Final Conclusion. The report shall specify whether the material passes or fails the test based on the test results and the criteria of Chapter 7 or 12, whichever is appropriate. If the material passes the test, the report shall specify that the material is flame resistant.

Chapter 15 Referenced Publications

15-1 The following documents or portions thereof are referenced within this standard and shall be considered part of the requirements of this document. The edition indicated for each reference is the current edition as of the date of the NFPA issuance of this document.

15-1.1 NFPA Publication. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, 1996 edition.

15-1.2 Other Publications.

15-1.2.1 AATCC Publications. American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.

AATCC Test Method 111A, *Weather Resistance: Sunshine Arc Lamp Exposure with Wetting*, 1990.

AATCC Technical Manual, *Standard Laboratory Practice for Home Laundering Fabrics Prior to Flammability Testing to Differentiate Between Durable and Non-Durable Finishes*, 1994.

Appendix A Explanatory Material

This Appendix is not a part of the requirements of this NFPA document but is included for informational purposes only.

A-2-4.2 A suitable alternate test cabinet that does not require a separate hood, equipped with a pin bar, burner-mounting system, gas control system, and timers is available as Model HVUL from Atlas Electric Devices, 4114 North Ravenswood Ave., Chicago, IL 60613; telephone (312) 327-4250.

A-2-4.3 A suitable burner is available as Catalog No. 03-902 from Fisher Scientific Co., 711 Forbes Ave., Pittsburgh, PA 15219-4785; telephone (412) 562-8300.

A-2-5.1 A suitable pressure gauge is available as Catalog No. 11-281B (0-300 mm Hg) from Fisher Scientific Co., 711 Forbes Ave., Pittsburgh, PA 15219-4785; telephone (412) 562-8300.

A-2-5.2 A suitable gas flow gauge for maintaining and monitoring the gas flow rate is available as Catalog No. N 03229-19 from Cole-Parmer Instrument Co., 7425 North Oak Park Ave., Chicago, IL 66048-9930; telephone (800) 323-4340.

A-2-10 A suitable brush can be obtained as Catalog No. 03-685 from Fisher Scientific Co., 711 Forbes Ave., Pittsburgh, PA 15219-4785; telephone (412) 562-8300.

A-9-2.1(d)1 A suitable glass fabric is Style 2116, available from Clark Schwebel Fiber Glass Corp., P.O. Box 2627, Anderson, SC 29622.

A-9-4 A suitable burner is available as Catalog No. 03-917 from Fisher Scientific Co., 711 Forbes Ave., Pittsburgh, PA 15219-4785; telephone (412) 562-8300.

Appendix B Test 1 Information

This Appendix is not a part of the requirements of this NFPA document but is included for informational purposes only.

B-1 Specimen Mounting Jig for Test 1.

B-1.1 Figure B-1.1 shows the construction details for a mounting jig, which makes it quicker, easier, and safer to mount the specimens for Test 1 onto the pin bar correctly.

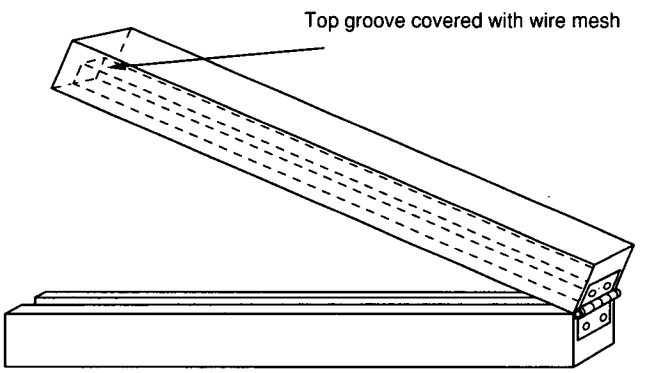

Figure B-1.1 Mounting jig for Test 1 specimens.

B-1.2 With the pin bar placed in the slot of the long arm of the jig, the specimen should be held so that the top seam of composite specimens [or an imaginary line 5 mm (0.196 in.) below the top edge of single-layer specimens] is aligned with the pins on the pin bar. The short arm of the jig then should be lowered over the pins and gently pushed downward. This secures the specimen to the pin bar. The short arm then should be raised and the pin bar, with the specimen attached, should be removed from the jig and mounted on the pin bar holder that is attached to the upper back panel of the test chamber. When in place, the pins of the pin bar should face the open side of the chamber (i.e., toward the operator).

B-2 History and Background.

B-2.1 In the past, curtain and drapery fabrics have been evaluated for their flammability characteristics primarily using the NFPA 701 test (1977 and 1989 editions), which has demonstrated a failure common to all similar tests that include a small-scale test using a mounting frame for the specimen. This failure occurs when thermoplastic products are tested. Thermoplastic tends to melt and pull away from the flame. Frequently, the thermoplastic melts and spills over and onto the frame, carrying some residual flame with it. When the test material and flame reach the frame, the frame acts as a wick and allows the material to continue burning for an extended time. Sometimes the flame self-extinguishes shortly after reaching the frame. At other times, the frame acts as a candle wick and allows the flame to continue to consume test material. In any event, thermoplastics frequently fail the afterflame criterion and sometimes the char length criterion as well.

B-2.2 In the past, NFPA 701 did permit the operator to test such thermoplastic materials using the large-scale test, which does not involve any sort of frame. In most cases, thermoplastic materials that failed the small-scale test using a frame would pass the large-scale test. This caused a problem because:

(a) More testing was needed for thermoplastic materials;

(b) Much more material was needed for the large-scale test; and

(c) The large-scale test is much more expensive to perform.

Furthermore, some regulatory jurisdictions required that materials pass both tests.

B-2.3 During the 1980s considerable effort was expended to modify the NFPA 701 tests and to arrive at pass/fail criteria for the small-scale test that would agree more closely with the results obtained with the large-scale test. During this time, a series of tests involving multilayer composites was performed at Southwest Research Institute by Belles and Beitel.

B-2.4 The tests by Belles and Beitel primarily involved combinations of materials, each of which passed the NFPA 701 small-scale test. The tests were performed on full-scale draperies hung close to a gypsum board wall, which was set up to be freestanding in a very large test room. A gypsum board ceiling extended out over the draperies for a distance of about 1 m (3.28 ft). The ignition source was a 280-mm (11-in.) flame from a bunsen burner. In order to ensure the validity of the test, the ignition flame was allowed to burn for 5 minutes.

B-2.5 These tests demonstrated, in general, that draperies consisting of face and lining materials made from the same type of fiber were less likely to propagate flame extensively. Also, draperies consisting of face and lining fabrics made from dissimilar materials were very likely to propagate flame extensively and to be destroyed almost totally in less than 2 minutes. The only exception to these results were draperies consisting of face and lining materials

made from cotton with nondurable, flame-resistant treatments. In these cases, the fabric tended to resist the flame for 2 minutes to 3 minutes and then to ignite and burn intensely. Since NFPA 701 is intended to evaluate fabrics for relatively short exposures to the flame, such fabrics generally pass NFPA 701 tests.

B-2.6 In any event, these tests demonstrated a serious weakness in the NFPA 701 test, since the same combinations of fabrics that propagated the flames extensively in the SwRI tests performed well in both the NFPA 701 large- and small-scale tests. This led the fiber and textile industry trade associations to work closely with NFPA, ASTM, and the Center for Fire Research at the National Institute for Science and Technology to implement a program to develop a new test that would evaluate both single-layer fabrics as well as multilayer composites, such as draperies for flame resistance, in a small-scale test that adequately predicts the results obtained at SwRI.

B-2.7 The first phase of work at NIST confirmed the results of the SwRI tests and also showed that existing small-scale tests did not predict the SwRI results.

B-2.8 The second phase resulted in the Test 1 method. Subsequent to the work at NIST, there has been some refinement of the test method as well as much verification testing. The Test 1 method, as presented here, does not reproduce the SwRI results precisely, since combinations that burned nearly completely (at least 95 percent destruction) in the SwRI tests showed a weight loss of approximately only 80 percent in this test. Nevertheless, the "good" performers at SwRI showed a weight loss of less than 40 percent in this test and the "bad" performers at SwRI showed a weight loss of greater than 40 percent. The one exception is vinyl-coated fabric blackout linings, which behave in a very inconsistent manner. Consequently, these linings and lined draperies containing such materials should be tested using Test 2, the large-scale test.

B-2.9 During the development of the Test 1 method, another test method was tried and eventually abandoned because of the cost of the apparatus and potential operator safety problems. This alternative test method was based on an analysis of the differences between the room-scale test and the NFPA 701 test. It was observed in the room-scale tests that flames usually propagated more rapidly on the portion of the specimen that faced the wall. This suggested that the radiant energy reflected back to the specimen by the wall was critical. In order to simulate this situation in a test cabinet such as the one used in the NFPA 701 test, it seemed appropriate to heat the back wall of the cabinet so that it would radiate heat to the back surface of the specimen. Consequently, a cabinet was equipped with electrical strip heaters mounted on a 1-cm (0.39-in.) aluminum plate that, in turn, was attached to the back of the cabinet. The remainder of the test was identical to ASTM D 3659, *Standard Test Method for Flammability of Apparel Fabrics by Semi-Resistant Method.* Back surface temperatures in excess of 240°C (465°F) were needed to duplicate the SwRI results. The quoted cost of a test chamber modified for ASTM D 3659 is $3000. The additional modification for heating the back wall surface was estimated at an additional $3000 for a total cost for the test chamber of approximately $6000. This cost would prevent many laboratories from participating in the interlaboratory test required to validate the test. For this reason, as well as the possibility of operators sustaining burns when placing and removing specimens, this alternative method was abandoned.

B-2.10 The present test method eliminates the need for heating the back surface by placing the specimen very close to the back surface. This tends to form a chimney that funnels the heat between the wall and the specimen. This heats the back wall, which, in turn, reradiates some of the heat onto the back surface of the specimen.

Appendix C Textile Considerations

This Appendix is not a part of the requirements of this NFPA document but is included for informational purposes only.

C-1 General Considerations.

C-1.1 While it is not possible to make combustible textiles and films completely resistant to charring and decomposition when exposed to flame or high temperature, a degree of flame resistance can be achieved. Most natural and synthetic fiber textiles can be treated chemically to increase their flame resistance. Such treatments might be fugitive and, hence, not durable to laundering, dry cleaning, or water leaching, while other treatments are very durable and can withstand many cycles of laundering, dry cleaning, or water leaching. Furthermore, some synthetic fibers are made from polymers that contain flame retardants in their basic structure. Both approaches could be necessary to impart flame resistance to materials in which different types of fibers are blended. It should be noted, however, that combinations of flame-resistant (FR) fibers with relatively small percentages of non-flame-resistant fibers can interfere with the flame-resistant effect of the FR fibers.

C-1.2 The hazards introduced by combustible textiles might, of course, be avoided entirely where the use of such noncombustible fibers as glass is practical.

C-1.3 Many flame-resistant synthetic materials soften and melt when exposed to heat and fire. They also can be subject to twisting, shrinking, dripping, and elongation when subjected to fire conditions.

C-2 Applications of Flame-Resistant Fabrics.

C-2.1 Standards for theater scenery, curtains, and furnishings in high risk or assembly occupancies are commonly set by law.

Flame-resistant fabrics are used in hotels, hospitals, and similar occupancies in the interest of the preservation of lives and property from fire.

C-2.2 Flame-resistant fabrics also are used as work clothing in industries where exposure to heat, open flames, and flash fire is a possibility.

C-2.3 Fabrics treated for flame and weather resistance are used for tents, tarpaulins, and other outdoor protective covering.

C-2.4 Reinforced plastic films with flame-resistant qualities are used in membrane structures.

C-2.5 Transparent plastic films often are used as a temporary enclosure for greenhouses and for construction work.

C-3 Flame-Retardant Treatments.

C-3.1 An increasing range of flame-retardant treatments for natural and synthetic fiber materials is becoming available. The selection of a particular treatment is governed by the intended use of the treated fabric.

C-3.2 Topical treatments based on water-soluble chemicals are generally the least expensive and most easily applied; however, they are subject to removal by the leaching action of water in laundering, scrubbing, or exposure to weather.

C-3.3 Some treatments can be impaired by the action of the solvents used in dry cleaning, and some gradually can lose their effectiveness under conditions of storage and usage not involving leaching.

C-3.4 Relatively temporary treatments are suitable only where proper treatment renewal can be ensured or for decorations and other items that are used briefly and then discarded.

C-3.5 Situations where retreatment is uncertain or not feasible indicate the choice of one of the durable treatments that is suitable for clothing and decorative fabrics. A number of these treatments can withstand extensive laundering and dry cleaning, although they are higher in cost and should be applied professionally.

C-3.6 For outdoor use, treatments have been developed that can be expected to remain effective for the useful life of the fabric under normal conditions of weather exposure.

C-3.7 It should be noted that painting or coating a treated or flame-resistant fabric or film could impair its flame-resistant qualities unless the coating itself is flame-resistant.

C-4 Physical Properties of Treated Fabrics.

C-4.1 A number of factors, which vary in importance depending on the end use of the fabric, should be considered in selecting a flame-retardant treatment.

C-4.2 The effect on the appearance, texture, and flexibility of the fabric often is of primary concern.

Appendix D Bibliography

This Appendix is not a part of the requirements of this NFPA document but is included for informational purposes only.

Arnold, G., Fisher, A., and Frohnsdorff, G. "Gillette Research Institute Final Report" (March 26, 1973), abstracted in the *Proceedings of the 1974 International Symposium on Flammability and Fire Retardants* (Editor: V.M. Bhatnager), Technomic Publishing Company, Lancaster, PA 17604.

Belles, D. W. and Beitel, J. J. "Do Multi-Layer Draperies Pass the Single-Layer Fire Test?" *Fire Journal*, September–October 1988, Vol. 82, No. 5, pp. 25–30, 90–91.

Krasny, J. F. and Fisher, A. L. "Laboratory Modeling of Garment Fires," *Textile Research Journal*, 1973, Vol. 43, pp. 272–283.

McCullough, E. A. and Noel, C. J. "Flammability Characteristics of Layered Fabric Assemblies," in *Proceedings of the 12th Annual Meeting, Information Council on Fabric Flammability*, 1978, pp. 175–184.

Appendix E Referenced Publications

E-1 The following document or portions thereof is referenced within this standard for informational purposes only and thus is not considered part of the requirements of this document. The edition indicated for the reference is the current edition as of the date of the NFPA issuance of this document.

E-1.1 ASTM Publication. American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM D 3659, *Standard Test Method for Flammability of Apparel Fabrics by Semi-Resistant Method*, 1993.

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Tentative Interim Amendment

NFPA 701

Standard Methods of Fire Tests for Flame-Resistant Textiles and Films

1996 Edition

Reference: 1-1.7, A-1-1.7(New)
TIA 96-1 (NFPA 701)

Pursuant to Section 4 of the NFPA Regulations Governing Committee Projects, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 701, *Standard Methods of Fire Tests for Flame-Resistant Textiles and Films,* 1996 edition. The TIA was processed by the Technical Committee on Fire Tests, and was issued by the Standards Council on January 12, 1996, with an effective date of February 1, 1996.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a proposal of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards-making process.

1. Revise 1-1.7 to read as follows:

1-1.7* Where materials are to be applied to surfaces of buildings or backing materials as interior finishes for use in buildings, they shall be tested in accordance with the appropriate test method for that particular interior finish application.

2. Add an appendix note to read as follows:

A-1-1.7 Other tests used to evaluate interior finishes include NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials,* and NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Wall Coverings.* Additional information on interior finishes can be found in Section 6-5, NFPA *101®, Life Safety Code®.*

The NFPA Codes and Standards Development Process

Since 1896, one of the primary purposes of the NFPA has been to develop and update the standards covering all areas of fire safety.

Calls for Proposals
The code adoption process takes place twice each year and begins with a call for proposals from the public to amend existing codes and standards or to develop the content of new fire safety documents.

Report on Proposals
Upon receipt of public proposals, the technical committee members meet to review, consider, and act on the proposals. The public proposals – together with the committee action on each proposal and committee-generated proposals – are published in the NFPA's Report on Proposals (ROP). The ROP is then subject to public review and comment.

Report on Comments
These public comments are considered and acted upon by the appropriate technical committees. All public comments – together with the committee action on each comment – are published as the Committee's supplementary report in the NFPA's Report on Comments (ROC).

The committee's report and supplementary report are then presented for adoption and open debate at either of NFPA's semi-annual meetings held throughout the United States and Canada.

Association Action
The Association meeting may, subject to review and issuance by the NFPA Standards Council, (a) adopt a report as published, (b) adopt a report as amended, contingent upon subsequent approval by the committee, (c) return a report to committee for further study, and (d) return a portion of a report to committee.

Standards Council Action
The Standards Council will make a judgement on whether or not to issue an NFPA document based upon the entire record before the Council, including the vote taken at the Association meeting on the technical committee's report.

Voting Procedures
Voting at an NFPA Annual or Fall Meeting is restricted to members of record for 180 days prior to the opening of the first general session of the meeting, except that individuals who join the Association at an Annual or Fall Meeting are entitled to vote at the next Fall or Annual Meeting.

"Members" are defined by Article 3.2 of the Bylaws as individuals, firms, corporations, trade or professional associations, institutes, fire departments, fire brigades, and other public or private agencies desiring to advance the purposes of the Association. Each member shall have one vote in the affairs of the Association. Under Article 4.5 of the Bylaws, the vote of such a member shall be cast by that member individually or by an employee designated in writing by the member of record who has registered for the meeting. Such a designated person shall not be eligible to represent more than one voting privilege on each issue, nor cast more than one vote on each issue.

Any member who wishes to designate an employee to cast that member's vote at an Association meeting in place of that member must provide that employee with written authorization to represent the member at the meeting. The authorization must be on company letterhead signed by the member of record, with the membership number indicated, and the authorization must be recorded with the President of NFPA or his designee before the start of the opening general session of the Meeting. That employee, irrespective of his or her own personal membership status, shall be privileged to cast only one vote on each issue before the Association.

Tentative Interim Amendment

NFPA 701

Standard Methods of Fire Tests for Flame-Resistant Textiles and Films

1996 Edition

Reference: A-2-4.2
TIA 96-2 (NFPA 701)

Pursuant to Section 4 of the NFPA Regulations Governing Committee Projects, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 701, *Standard Methods of Fire Tests for Flame-Resistant Textiles and Films,* 1996 edition. The TIA was processed by the Fire Tests Committee, and was issued with revision by the Standards Council on January 15, 1997, with an effective date of February 4, 1997.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a proposal of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards-making process.

1. Delete paragraph A-2-4.2 and the last parenthetical sentence in 2-4.2.

Sequence of Events Leading to Publication of an NFPA Committee Document

Call for proposals to amend existing document or for recommendations on new document.

▼

Committee meets to act on proposals, to develop its own proposals, and to prepare its report.

▼

Committee votes on proposals by letter ballot. If two-thirds approve, report goes forward. Lacking two-thirds approval, report returns to committee.

▼

Report is published for public review and comment. (Report on Proposals - ROP)

▼

Committee meets to act on each public comment received.

▼

Committee votes on comments by letter ballot. If two-thirds approve, supplementary report goes forward. Lacking two-thirds approval, supplementary report returns to committee.

▼

Supplementary report is published for public review. (Report on Comments - ROC).

▼

NFPA membership meets (Annual or Fall Meeting) and acts on committee report (ROP and ROC).

▼

Committee votes on any amendments to report approved at NFPA Annual or Fall Meeting.

▼

Complaints to Standards Council on Association action must be filed within 20 days of the NFPA Annual or Fall Meeting.

▼

Standards Council decides, based on all evidence, whether or not to issue standard or to take other action, including hearing any complaints.

▼

Appeals to Board of Directors on Standards Council action must be filed within 20 days of Council action.