



March 7, 2008

TO: PARTIES INTERESTED IN EVALUATION REPORTS ON FOAM PLASTIC SHAPES FOR PARAPET APPLICATIONS

SUBJECT: Acceptance Criteria for Foam Plastic Shapes for Parapet Applications, Subject AC161-0208-R1 (YM/BG)

Dear Madam or Sir:

Enclosed is a copy of the revised acceptance criteria approved by the ICC-ES Evaluation Committee on February 7, 2008, effective March 1, 2008.

The acceptance criteria was revised to update the criteria to the 2006 *International Building Code*® (IBC) and to address fire performance requirements of foam plastic shapes attached to parapet walls and coated with an EIFS lamina.

If you have any questions, please contact Yamil Moya, P.E., staff engineer, at (800) 423-6587, extension 3257. You may also reach us by e-mail at es@icc-es.org.

Yours very truly,

A handwritten signature in black ink that reads 'Kurt Stochlia'.

Kurt Stochlia, P.E.
Vice President

KS/YM/II

Enclosure

cc: Evaluation Committee



ACCEPTANCE CRITERIA FOR FOAM PLASTIC SHAPES FOR PARAPET APPLICATIONS

AC161

Approved February 2008

Effective March 1, 2008

Previously approved January 2000

PREFACE

Evaluation reports issued by ICC Evaluation Service, Inc. (ICC-ES), are based upon performance features of the International family of codes and other widely adopted code families, including the Uniform Codes, the BOCA National Codes, and the SBCCI Standard Codes. Section 104.11 of the *International Building Code*® reads as follows:

The provisions of this code are not intended to prevent the installation of any materials or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

Similar provisions are contained in the Uniform Codes, the National Codes, and the Standard Codes.

This acceptance criteria has been issued to provide all interested parties with guidelines for demonstrating compliance with performance features of the applicable code(s) referenced in the acceptance criteria. The criteria was developed and adopted following public hearings conducted by the ICC-ES Evaluation Committee, and is effective on the date shown above. All reports issued or reissued on or after the effective date must comply with this criteria, while reports issued prior to this date may be in compliance with this criteria or with the previous edition. If the criteria is an updated version from the previous edition, a solid vertical line (|) in the margin within the criteria indicates a technical change, addition, or deletion from the previous edition. A deletion indicator (→) is provided in the margin where a paragraph has been deleted if the deletion involved a technical change. This criteria may be further revised as the need dictates.

ICC-ES may consider alternate criteria, provided the report applicant submits valid data demonstrating that the alternate criteria are at least equivalent to the criteria set forth in this document, and otherwise demonstrate compliance with the performance features of the codes. Notwithstanding that a product, material, or type or method of construction meets the requirements of the criteria set forth in this document, or that it can be demonstrated that valid alternate criteria are equivalent to the criteria in this document and otherwise demonstrate compliance with the performance features of the codes, ICC-ES retains the right to refuse to issue or renew an evaluation report, if the product, material, or type or method of construction is such that either unusual care with its installation or use must be exercised for satisfactory performance, or if malfunctioning is apt to cause unreasonable property damage or personal injury or sickness relative to the benefits to be achieved by the use of the product, material, or type or method of construction.

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ACCEPTANCE CRITERIA FOR FOAM PLASTIC SHAPES FOR PARAPET APPLICATIONS

1.0 INTRODUCTION AND SCOPE

1.1 Purpose: The purpose of this criteria is to establish requirements for foam plastic formed shapes, for exterior parapet applications, to be recognized in ICC Evaluation Service, Inc. (ICC-ES), evaluation report under the 2006 *International Building Code*[®] (IBC) and the 1997 *Uniform Building Code*[™] (UBC). The bases for recognition are IBC Section 104.11 and UBC Section 104.2.8.

The reason for the development of this criteria is to provide guidelines for the evaluation of foam plastic shapes installed on exterior parapet walls, since the codes do not include provisions for foam plastic shapes in parapet applications.

1.2 Scope: This criteria applies to expanded or extruded polystyrene (EPS or XEPS) foam plastic shapes attached to the exterior side of a parapet wall with metal straps and adhesives. The exterior side of the foam plastic shape is then coated with an approved wall covering.

1.3 Codes and Referenced Standards:

1.3.1 2006 *International Building Code*[®] (IBC), International Code Council.

1.3.2 1997 *Uniform Building Code*[™] (UBC).

1.3.3 ASTM C 297-94, Standard Test Method for Tensile Strength of Flat Sandwich Constructions in Flatwise Plane, ASTM International.

1.3.4 ASTM E 108-04, Standard Test Method for Fire Tests of Roof Coverings, ASTM International.

1.3.5 ASTM E 330-02, Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference, ASTM International.

1.3.6 ASTM G 155-04, Practice for Operating Light-exposure Apparatus (Xenon-Arc Type) with/without Water for Exposure of Nonmetallic Materials, ASTM International.

2.0 BASIC INFORMATION AND REPORTS OF TESTS

2.1 General: The following information shall be submitted:

2.1.1 Product Description: Complete information, as applicable, concerning system components, material specifications, dimensions, and the manufacturing process.

2.1.2 Installation Instructions: Dimensioned scale drawings and installation details noting installation limitations, foam plastic shape dimensions, and size and location of fasteners.

2.1.3 Packaging and Identification: Method of component packaging shall be disclosed. Identification shall include the evaluation report number, the name or logo of the inspection agency, and notice of any product installation limitations. A copy of the installation instructions packaged with the product shall be submitted.

2.1.4 Field Preparation: Method of field-cutting, trimming or forming, and treatment of cut edges.

2.2 Testing Laboratories: Test laboratories shall comply with Section 2.0 of the ICC-ES Acceptance Criteria for Test Reports (AC85) and Section 4.2 of the ICC-ES Rules of Procedure for Evaluation Reports.

2.3 Test Reports: Test reports shall comply with AC85.

2.4 Product Sampling: Products shall be sampled in accordance with Sections 3.1, 3.3 and 3.4 of AC85.

3.0 Test and Performance Requirements

3.1 Durability: Testing shall be required as follows:

1. Weatherometer tests as set forth in Section 4.1.
2. Freeze-thaw tests as set forth in Section 4.2.

3.2 Joints: Locations for expansion and control joints shall be determined and specified by the manufacturer. All expansion and control joint materials shall be corrosion-resistant as set forth in Section 3.1 or corrosion-resistant metals. Expansion and control joints shall be components of the test specimens for durability and structural tests.

3.3 Structural Considerations: Structural tests are required to determine allowable vertical load and negative wind pressures that may be imposed on the system. Testing requirements are set forth in Sections 4.3 and 4.4. The test program shall incorporate the following:

1. Test specimens shall be based on the minimum conditions of installation. For vertical load capacity, the smallest section shall be tested as well as the largest section. If only one section is tested, the corresponding limitation based on this test shall be placed in the evaluation report.

2. No deflection limit shall be imposed, since the system is used in uninhabitable locations.

3.4 Fire Performance Requirements: The foam plastic shape shall be tested in accordance with Section 4.7 at the maximum thickness and density intended for its end use application.

4.0 TESTING

4.1 Accelerated Weathering Test (Weatherometer):

1. For each substrate for which approval is sought (plywood, plaster, OSB or other substrates), five specimens of the coated foam plastic shapes, adhered to the substrate, shall be prepared. Five additional specimens are prepared as control.

2. Tests shall be in accordance with ASTM G 155. The operating schedule shall be either Cycle 1, 5, or 9, as set forth in Table X3.1 of ASTM G 155.

3. The test shall be for a minimum of 2,000 hours.

4. Failure is defined as surface changes, as viewed by minimum 5× magnification, that reveal cracking, checking, crazing, erosion, or other characteristics that might affect performance of the product.

5. Tensile bond tests in accordance with ASTM C 297 shall be conducted on control specimens and specimens completing weatherometer exposure. The test results are analyzed to determine whether a significant loss of bond strength occurs after weatherometer exposure. The test method is ASTM C 297.

4.2 Freeze-thaw Tests:

1. For each substrate for which recognition is sought (plywood, plaster, OSB or other substrates), five 6-inch-

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square (152 mm square) samples of the coated foam plastic shapes, adhered to the substrate, shall be prepared.

2. Samples are subjected to 10 freeze-thaw cycles. Each cycle consists of air drying at 120°F (49°C) for a minimum of eight hours, followed by total immersion in water at 70°F to 80°F (21.1°C to 26.7°C) for eight hours, and exposure to 20°F (-6.67°C) for 16 hours.

3. Failure is defined as surface changes, as viewed by minimum 5X magnification, that reveal cracking, checking, crazing, erosion or other characteristics that may affect performance as an enclosure.

4. Delamination, or indication of same between components, is also defined as failure.

Exception: Freeze-thaw tests are not required if the system is installed in areas where the annual rainfall does not exceed 20 inches (508 mm), and the average of the daily lows for any month is at least 30°F (-1.1°C).

4.3 Structural Performance Tests (Foam Plastic Shape to Parapet Surface):

1. Testing shall determine the vertical load capacity of the foam plastic parapet system. Specimens shall be prepared in accordance with the manufacturer's recommendations, on the surfaces for which recognition is sought. The EPS or XEPS foam plastic shape will be adhesively attached to each substrate intended for recognition, using the adhesive/base coat recommended by the manufacturer. Specimens shall be a minimum of 8 feet (2438 mm) long, and the width of the plastic shape, and shall include any features such as scored joints, vertical control joints and other architectural features, if these features are to be recognized in the evaluation report. A minimum of three specimens are required.

2. Specimens shall be loaded vertically or horizontally, at the discretion of the testing laboratory. The load shall be applied to a steel plates 8 inches (203 mm) wide and 12 inches (305 mm) long. The steel plate edge is located 1/4 inch (6.4 mm) from the front edge of the assembly, and the load is applied at the geometric center of the steel loading plate. Figure 1 illustrates the test specimens. The application of load to ultimate shall consist of at least six increments, with a 10-second load duration for each increment. The duration may be increased, if necessary, to ensure that the load stabilizes.

3. For end conditions, the 8-inch (203 mm) edge of the steel loading plate is flush with the end of the assembly. For interior conditions, the steel loading plate is at the midspan of the assembly.

4. Conditions of acceptance will be based on the following: Allowable load will be based on a factor of safety of 5.0, applied to the average uniform load, if all of the following are satisfied:

a. No single test result may vary by more than 15 percent from the average of the three test results. Variations exceeding this limit require larger safety factors.

b. Indentation of the surface shall be considered when determining the final allowable load.

4.4 Metal Insert to Foam Plastic Shape:

1. The insert will be located at the minimum edge distance specified by the manufacturer, and at a location where the edge distance does not influence the final result.

2. Each specimen is a minimum of 48 inches (1219 mm) long and 12 inches (305 mm) wide. A self-drilling screw is installed in the insert, 1 inch (25.4 mm) from the end. The screw is pulled in tension until failure occurs. The insert shall be tested for minimum edge and end conditions; otherwise the limitation will be based on the tests conducted.

3. A minimum of three tension tests shall be conducted for each condition.

4. Conditions of acceptance will be based on the following: Allowable load will be based on a factor of safety of 5, applied to the average uniform load, if all of the following are satisfied:

a. No single test result may vary by more than 15 percent from the average of the three test results. Variations exceeding this limit require larger safety factors.

b. Indentation of the surface shall be considered when determining the final allowable load.

4.5 Metal Flashing Attachment to Metal Inserts:

1. This test is conducted in accordance with applicable sections of ASTM E 330. The purpose of the test is to determine the negative transverse load capacity of the metal flashing covering when attached to the foam plastic parapet system. The system consists of the metal insert, located at a specific location in the EPS or XEPS foam plastic shape. A series of 2-inch (51 mm) metal strips is laid transversely between the inserts, and spaced at 24 inches (610 mm) on center. The metal flashing is formed to fit over the system, and is attached to the system by fasteners.

2. Air bag(s) shall be placed between the metal flashing and the EPS or XEPS surface. Air is introduced into the air bag and the resulting positive pressure is controlled with a water manometer or other suitable measuring device. Dial indicators are placed at each strip/clip location and at the midpoint. The system is loaded at increments of 1-inch (25 mm) water column, with the load released after 3 inches (76 mm) and 6 inches (152 mm) water column, loading. The load is maintained at each increment for a minimum of 10 seconds or until each dial indicator indicates no movement.

3. A minimum of three test specimens per configuration are required.

4. Condition of acceptance for allowable load is a safety factor of 3.0, applied to the lowest ultimate test load of the three specimens.

4.6 Other Substrates: Results of tests conducted over substrates as specified in Section 4.3 can be extended to foam plastic shapes adhered to other substrates (e.g., wood-based sheathing, cementitious backer units and gypsum board) under the following conditions:

1. The foam plastic shape is adhered to all sheathing in question (e.g., plywood, particleboard, waferboard and OSB; gypsum panels; and cementitious backer units).

2. Tensile bond tests are conducted in accordance with ASTM C 297.

3. Tensile bond test results average a minimum of 15 psi (103 kPa).

4.7 Fire Performance Tests: Testing shall be conducted in accordance with the ASTM E 108, except as modified below:

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4.7.1 The spread of flame test shall be conducted in accordance with Section 9 of ASTM E 108, except that the fire exposure period shall be extended to 15 minutes.

4.7.2 One specimen shall be prepared in accordance with the manufacturer's recommendation, for installation on each wall substrate for which recognition is sought. The EPS or XEPS foam plastic shape, with approved wall covering base coat, shall be attached to each substrate intended for recognition using the adhesive, supporting metal components, and fasteners supplied by the manufacturer. The EPS or XEPS foam plastic shape shall be coated using the approved wall covering finish coat intended for recognition. The test specimen assembly (see Figure 1 for a representative foam shape assembly) shall be attached to the test wall in accordance with the manufacturer's recommended installation instructions, as shown in Figure 2 of this criteria. The width and height of the test wall shall be 6 feet (1.83 m). The thickness of the tested specimen assembly shall be based on the maximum vertical and horizontal dimensions, and cross-sectional area, for which recognition is sought for the EPS or XEPS foam plastic shape. See Section 4.7.3 of this criteria for the location of the test specimen assembly on the test wall.

4.7.3 The location and direction of the test specimen shall be as described in Figure 2 of this criteria and shall be determined by the testing laboratory as the location that brings the most heat to bear on the test specimen.

4.7.4 Conditions of Acceptance: The test specimen wall assembly shall be considered as meeting the requirements for acceptable performance if during the 15-minute test period:

4.7.4.1 Sustained flaming shall not occur over the exterior face of the test specimen. There shall be no lateral spread of flame from the path directly exposed to the test flame to either end of the test specimen. Small, intermittent flames along seams, joints, or on the exterior face of the test assembly in the region of direct flame exposure may be ignored.

4.7.4.2 Fire-related damage to the core insulation shall not extend to either end of the test specimen. Damage to the core insulation occurs when the temperature within the insulation core outside the region of direct flame exposure exceeds 750°F (399°C), as determined by four equally spaced, Type K, thermocouples placed within 6 inches (152 mm) of direct flame exposure. Following the 15-minute exposure to the test flame, the core of the specimen shall be examined visually to determine if the flame propagation extends beyond the region of direct flame exposure.

4.7.4.3 There shall be no ignition of the foam plastic shape during the 15-minute test period that results in sustained flaming.

4.7.4.4 No portion of the foam plastic shape assembly shall fall from the specimen that continues to flame after reaching the floor.

4.7.4.5 The foam plastic shape assembly shall remain in place during and after the flame exposure.

5.0 QUALITY CONTROL

5.1 The foam plastic parapet systems shall be manufactured under an approved quality control program with inspections by an inspection agency currently accredited by the International Accreditation Service (IAS) or otherwise acceptable to ICC-ES.

5.2 Quality documentation complying with the ICC-ES Acceptance Criteria for Quality Documentation (AC10) shall be submitted.

6.0 EVALUATION REPORT RECOGNITION

The evaluation report shall include:

6.1 Typical installation details for the foam plastic parapet system at typical areas of termination (such as parapets, intersection with other materials, expansion and control joints, and roofing) shall be submitted. Details shall be of camera-ready quality, for inclusion in evaluation reports, and shall be consistent with recommended application instructions.

6.2 The evaluation report shall include the following statements:

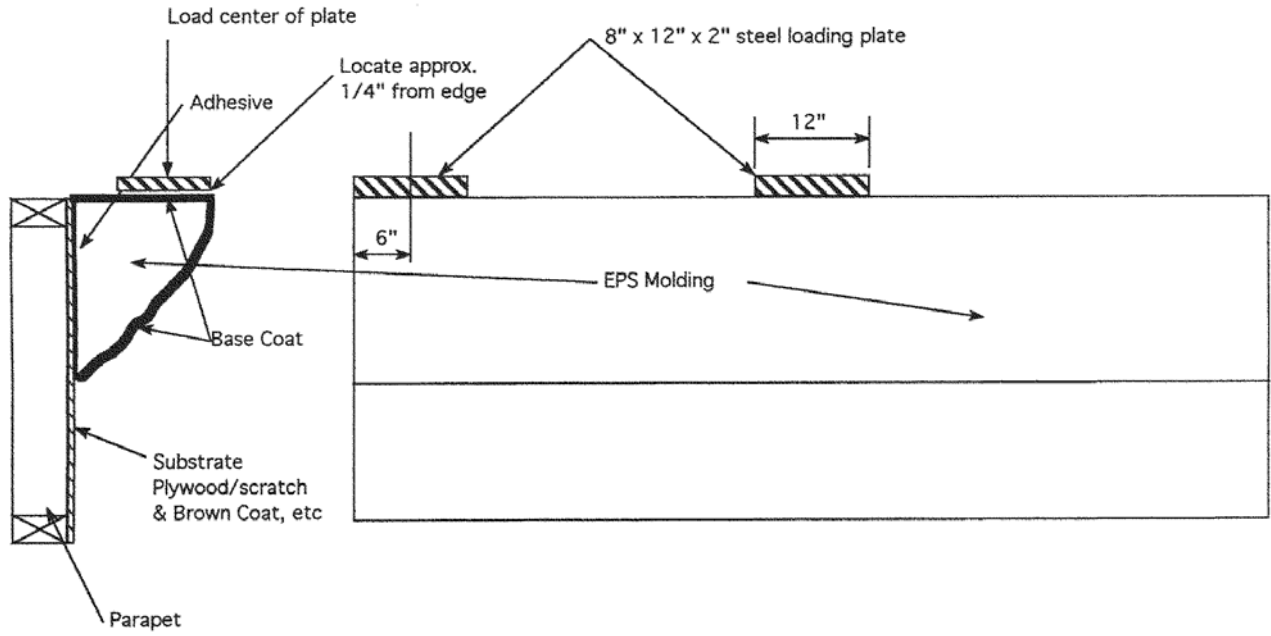
6.2.1 Plans, details and specifications concerning proper installation of the foam plastic system, applicable to the specific building under consideration, shall be part of the plans submitted to the building official for approval.

6.2.2 Allowable loads as determined by structural tests.

6.2.3 Application of the foam plastic shapes is limited to exterior walls of Type V-B construction (IBC) or Type V-N (UBC).

6.2.4 Installation shall be by a contractor recognized by the proponent as being qualified to perform such installations. A list containing the names and addresses of recognized contractors shall be maintained by the proponent, and shall be available to the building official or ICC-ES upon request. An installation card confirming compliance with the evaluation report shall be completed by the contractor, and presented to the building official at the completion of each project. ■

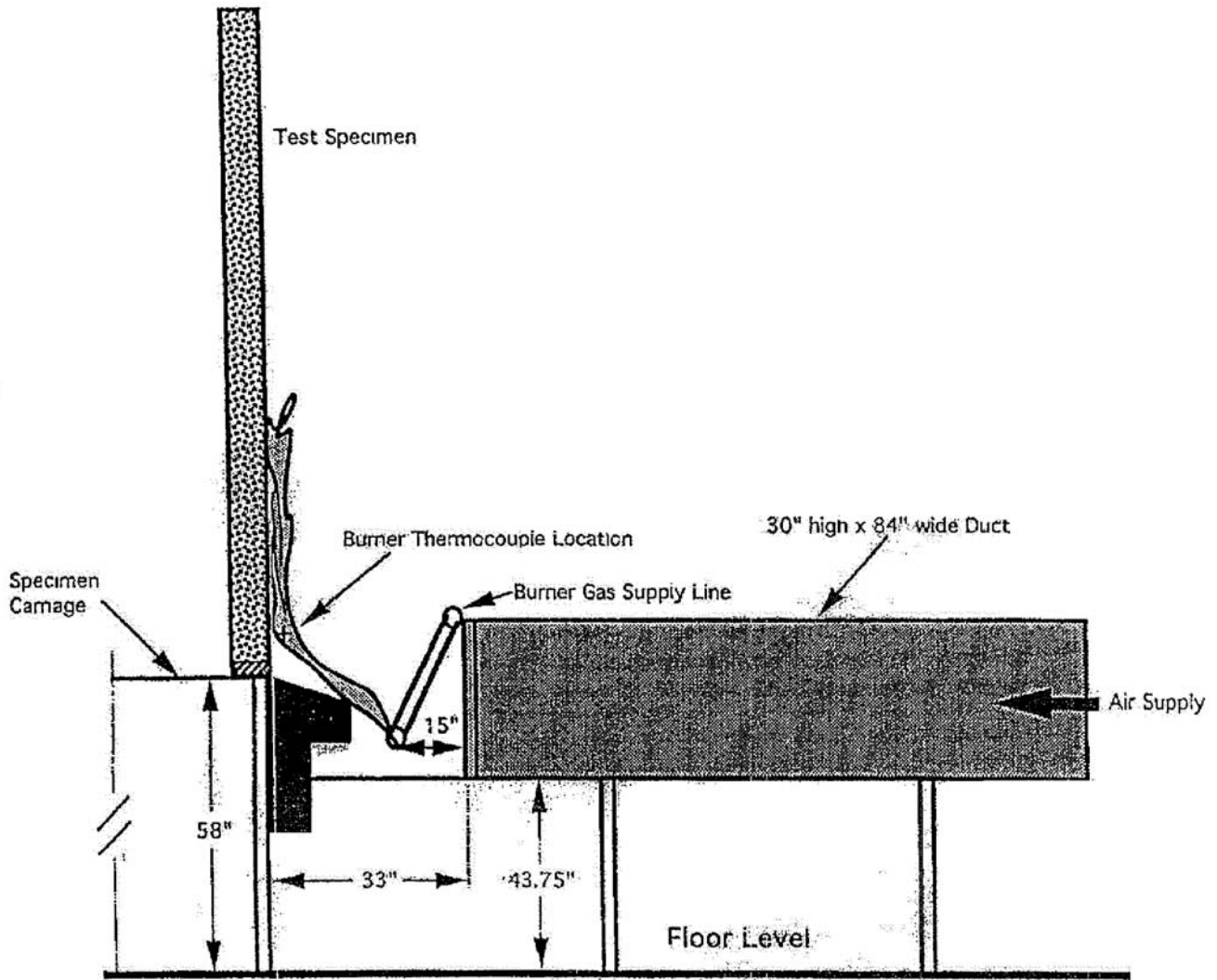
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For SI: 1 inch = 25.4 mm.

FIGURE 1—TYPICAL DETAILS FOR CONCENTRATED LOAD TEST ON THE SYSTEM

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For SI: 1 inch = 25.4 mm.

FIGURE 2—SCHEMATIC DIAGRAM OF FIRE PERFORMANCE TEST (SEE SECTION 4.7)