



Designation: C1764 – 20

Standard Test Methods for Non Metallic Plaster Bases (Lath) Used With Portland Cement Based Plaster in Vertical Wall Applications¹

This standard is issued under the fixed designation C1764; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 These test methods evaluate the performance of vertical wall applications of non metallic plaster bases used with Portland cement based plaster under a variety of test exposures.

1.2 *Units*—The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other, and values from the two systems shall not be combined.

1.3 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

C926 Specification for Application of Portland Cement-Based Plaster

E330/E330M Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

E631 Terminology of Building Constructions

E2098/E2098M Test Method for Determining Tensile

Breaking Strength of Glass Fiber Reinforcing Mesh for Use in Class PB Exterior Insulation and Finish Systems (EIFS), after Exposure to a Sodium Hydroxide Solution

2.2 ICC-ES Acceptance Criteria:³

AC 191 Acceptance Criteria for Metal Plaster Bases (Lath)

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms used in these test methods, refer to Terminology **E631**.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *non metallic, plaster base (lath)*—a product manufactured from non metal materials that serves as a base for Portland cement based plaster.

3.2.1.1 *Discussion*—Examples of non metallic materials are plastic, glass fiber, and nylon

4. Significance and Use

4.1 General:

4.1.1 Non metallic reinforced Portland cement based plaster are vertically applied exterior wall claddings that may be subject to variety of conditions over the claddings service life. These test methods evaluate performance under a variety of test conditions and exposures. Any given project may not be subject to all of the test conditions described herein and all of the test methods may not evaluate all exposures for a given project.

4.2 Transverse Load:

4.2.1 This test method determines the ultimate wind load resistance of the wall assembly including influence of the framing, sheathing, and means of attachment.

4.3 Vertical Load:

4.3.1 The weight and attachment mechanism of Portland cement Based Plaster results in a vertical load transfer to the plaster base. This test method determines the ultimate vertical load capacity of the cladding assembly based on taking the specimen to failure.

4.4 Embedment:

³ Available from International Code Council (ICC), 500 New Jersey Ave., NW, 6th Floor, Washington, DC 20001, <http://www.iccsafe.org>.

¹ These test methods are under the jurisdiction of ASTM Committee C11 on Gypsum and Related Building Materials and Systems and is the direct responsibility of Subcommittee C11.02 on Specifications and Test Methods for Accessories and Related Products.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

4.4.1 Plaster bases serve as a key, reinforcement and attachment mechanism for Portland cement based plaster. The thickness, profile, and material properties of the plaster bases must be such that it is adequately embedded in the Portland cement based plaster. This can be accomplished through use of a self furred non metallic plaster base or other means such as furring strips. This test method determines the effectiveness of the furring mechanism to ensure that the minimum embedment is obtained.

4.5 *Fastener Pull Through Resistance:*

4.5.1 The non metallic lath is secured to the building frame or substrate with fasteners. This test method evaluates the fastener attachment effectiveness.

4.6 *Alkali Resistance (Test Method Applies to Glass Fiber Materials Only):*

4.6.1 In accordance with Test Method **E2098/E2098M**.

5. Sampling, Test Specimens, and Test Units

5.1 The number, size and configuration of the test specimens shall be in accordance with each test method, with the exception of Transverse Load tests which shall incorporate wood or steel framing as determined by the user. Samples shall be representative of standard products and construction methods.

6. Test Specimens

6.1 *Transverse Load:*

6.1.1 Construct three test specimens. Test specimen size shall be minimum 4 by 8 ft (1.2 by 2.4 m) and constructed representative of end use conditions. Framing members shall be wood or steel as determined by the user. Specification **C926** Portland cement based plaster shall be mixed and applied in the configuration of the test specimen.

6.2 *Vertical Load:*

6.2.1 Construct three test frames measuring 12 by 20 in. (305 by 508 mm) using nominal 2 by 4 in. (50 by 100 mm) wood lumber with specific gravity of 0.42. The test frame shall have one intermediate stud with top and bottom plates and sheathed one side with ½ in. (13 mm) thick gypsum sheathing. Attach studs to plates using two 16d (3½ in. (89 mm) length) nails and sheathing to framing using 6d (2 in. length) common nails or equal fastened 8 in. (200 mm) on center. A test panel shall be prepared measuring 6 in. (152 mm) high by 16 in. (406 mm) wide and consisting of a water-resistive barrier (provided to prevent adhesion of the test panel to the test frame); non metallic plaster base, which is attached through the water-resistive barrier to the intermediate framing member with one fastener; and apply Portland cement based plaster in accordance with Specification **C926**. The samples shall be cured a minimum of 28 days. Refer to **Fig. 1** for an illustration of the test assembly.

6.3 *Embedment:*

6.3.1 Construct one test frame using nominal 2 by 4 in. (50 by 100 mm) wood lumber with specific gravity of 0.42 unless specified otherwise by the manufacturer. The test frame shall be 48 in. (1.2 m) wide and high studs spaced 16 in. (406 mm) on center, wood plates top and bottom and sheathed with

minimum ½ in. (13 mm) thick wood based sheathing. Two layers of a water resistive barrier shall be attached to the sheathing using staples 12 in. (305 mm) on center around the panel perimeter. A plaster stop or grounds shall be fastened around the panel perimeter. Apply the non metallic lath to the sample with one horizontal lap and fastened to the stud in accordance with the manufacturers recommendations. Apply the scratch and brown Portland cement based plaster in accordance with Specification **C926**.

6.4 *Fastener Pull Through Resistance:*

6.4.1 Construct five test frames using nominal 2 by 4 in. (50 by 100 mm) wood framing with specific gravity of 0.42 and any other types of framing as specified by the non metallic lath manufacturer. The test frame shall be 12 in. (305 mm) wide and sufficient height to permit placement of three or more lath fasteners. One stud centered in the panel and sheathed one side with ½ in. (13 mm) thick gypsum sheathing. Two layers of a water resistive barrier shall be attached to the sheathing using staples 12 in. (305 mm) on center around the panel perimeter. A plaster stop or grounds shall be fastened around the panel perimeter. Apply the lath to the sample with one horizontal lap and fastened to the stud in accordance with the manufacturers recommendations. Apply the Portland cement based plaster in accordance with Specification **C926**. Allow the stucco to cure and remove the sheathing that exists between the wood framing.

6.5 *Alkali Resistance (Test Method Applies to Glass Fiber Materials Only):*

6.5.1 Ten specimens in the warp and ten specimens in the weft directions should be cut from the roll glass fiber lath and labeled as control specimens. Ten specimens in the warp and ten specimens in the weft directions should be cut from the roll glass fiber lath and labeled as conditioned specimens. All specimens were 2 in. (50 mm) wide by 12 in. (305 mm) long.

7. Apparatus

7.1 The description of apparatus in this section is general in nature; consequently, any set up capable of performing the test is acceptable.

7.2 *Transverse Load:*

7.2.1 The apparatus shall be capable of subjecting specimen uniformly to test conditions described in Test Method **E330/E330M**, Procedure A.

7.3 *Vertical Load:*

7.3.1 Universal testing machine with capabilities to accommodate **9.2.1**.

7.4 *Fastener Pull Through Resistance:*

7.4.1 Universal testing machine with capabilities to accommodate **9.4.1**.

7.5 *Alkali Resistance (Test Method Applies to Glass Fiber Materials Only):*

7.5.1 The apparatus shall be capable of subjecting specimen uniformly to test conditions described in Test Method **E2098/E2098M**.

8. Conditioning

8.1 *Transverse Load:*

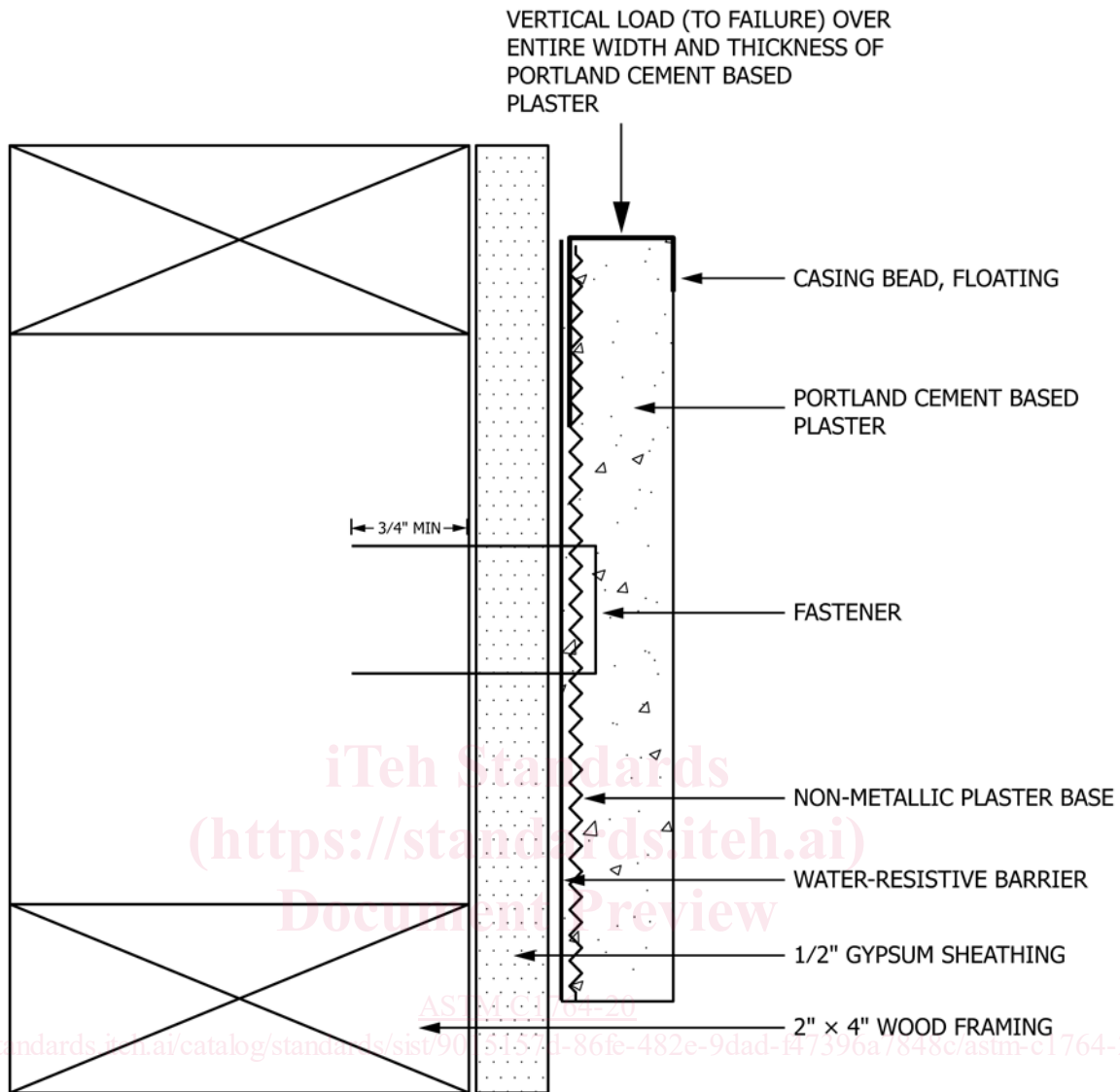


FIG. 1 Test Assembly

8.1.1 Cure test specimens 28 days under ambient conditions prior to testing.

8.2 Vertical Load:

8.2.1 Cure test specimens 28 days under ambient conditions prior to testing.

8.3 Embedment:

8.3.1 Cure test specimens 28 days under ambient conditions prior to testing.

8.4 Fastener Pull Through Resistance:

8.4.1 Cure test specimens 28 days under ambient conditions prior to testing.

8.5 Alkali Resistance (Test Method Applies to Glass Fiber Materials Only):

8.5.1 In accordance with Test Method E2098/E2098M.

9. Procedure

9.1 Transverse Load:

9.1.1 In accordance with Test Method E330/E330M, Procedure A. Terminate test when specified pressure can not be maintained due to failure of the test specimen.

9.2 Vertical Load:

9.2.1 Apply vertical, downward load uniformly across entire width of specimen, at a rate of one inch/minute until failure using a universal testing machine. Record deflection, results and failure mechanism.

9.3 Embedment:

9.3.1 Cut the test panel diagonally from the intersection of the top stud to the intersection of the bottom stud such that the cross section of the Portland cement plaster is visible. Measure each strand with respect to its embedment in the Portland cement plaster. Make all from the back plane of the non metallic lath to the back plane of the plaster.

9.4 Fastener Pull Through: