Designation: C 1305 – 00

Standard Test Method for Crack Bridging Ability of Liquid-Applied Waterproofing Membrane[1]

This standard is issued under the fixed designation C 1305; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers a laboratory procedure for determining the ability of a waterproofing membrane to bridge a crack in the substrate.

1.2 The values stated in SI units are to be regarded as the standard. The inch-pound units given in parentheses are for information only.

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

1.4 There are no ISO standards similar or equivalent to this ASTM standard.

2. Referenced Documents

2.1 *ASTM Standards:*

C 33 Specification for Concrete Aggregates[2]

C 150 Specification for Portland Cement[3]

C 717 Terminology of Building Seals and Sealants[4]

3. Terminology

3.1 *Definitions*—Refer to Terminology C 717 for definitions of technical terms used in this test method. Some of these are *elastomeric, substrate, waterproofing*, and *compound*.

4. Summary of Test Method

4.1 This test method consists of casting five specimens of membrane on mortar substrates containing a preexisting crack and allowing them to age 14 days at standard conditions followed by seven days in an air-circulating oven at 70°C (158°F), placing them in a test machine, and subjecting the assembly to ten cycles of movement.

5. Significance and Use

5.1 This test method is used to indicate a waterproofing membrane's ability to maintain its integrity while bridging a preexisting crack in the substrate at low ambient temperatures, when the membrane is least likely to be flexible.

6. Comparison to Other Standards

6.1 The committee with jurisdiction over this standard is not aware of any comparable standards published by other organizations.

7. Apparatus and Materials

7.1 *Automatic Extension and Compression Machine*, with cold box capable of maintaining − 26 ± 1°C (−15 ± 2°F).

7.2 *Circulating Hot-Air Oven*.

7.3 *Portland Cement*, high early strength conforming to Specification C 150, Type III.

7.4 *Fine Aggregate*, conforming to Specification C 33.

7.5 *Aluminum Angles*, 75 by 50 by 25 mm (3 by 2 by 1 in.), if needed.

7.6 *Epoxy Cement*, or gun-grade construction mastic, if needed.

7.7 *Masking Tape*.

7.8 *Molds*, six, 50 by 25 by 25 mm (2 by 1 by 1 in.) inside dimensions, or 75 by 88 by 25 mm (0.5 by 1.5 by 1 in.) notches in either side, as shown in Fig. 1, for casting mortar blocks.

8. Preparation of Substrates

8.1 Mix 1 part by weight of Type III Portland cement with 2 parts by weight of fine aggregate and stir in approximately 0.7 part by weight of water to produce a uniform mixture.

8.2 Pour the mixture into the mold and allow to cure one day at 100 % relative humidity followed by six days in tap water, both at standard temperature.

NOTE 1—Prepare five sets of two blocks.

8.3 Cut or grind the test surfaces of the mortar blocks to remove laitance and produce a level substrate, free of fins or burrs. If a release coating is used on the mold, only the top surface of the mortar blocks, not exposed to the release coating, shall be used as the test surface.[5]

8.4 When a quantity of blocks is prepared, they shall be stored in saturated lime water until needed.

8.5 Rinse any residue from the substrates with tap water and

[1] This test method is under the jurisdiction of ASTM Committee C-24 on Building Seals and Sealants and is the direct responsibility of Subcommittee C24.80 on Building Deck Waterproofing Systems.

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[2] *Annual Book of ASTM Standards*, Vol 04.02.

[3] *Annual Book of ASTM Standards*, Vol 04.01.

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

[5] Mortar blocks prepared as described in this test method are available from Custom Concrete Co., 270 Stuart Road, Carlisle, PA 17013 or KAPPCO, Cleveland, OH.

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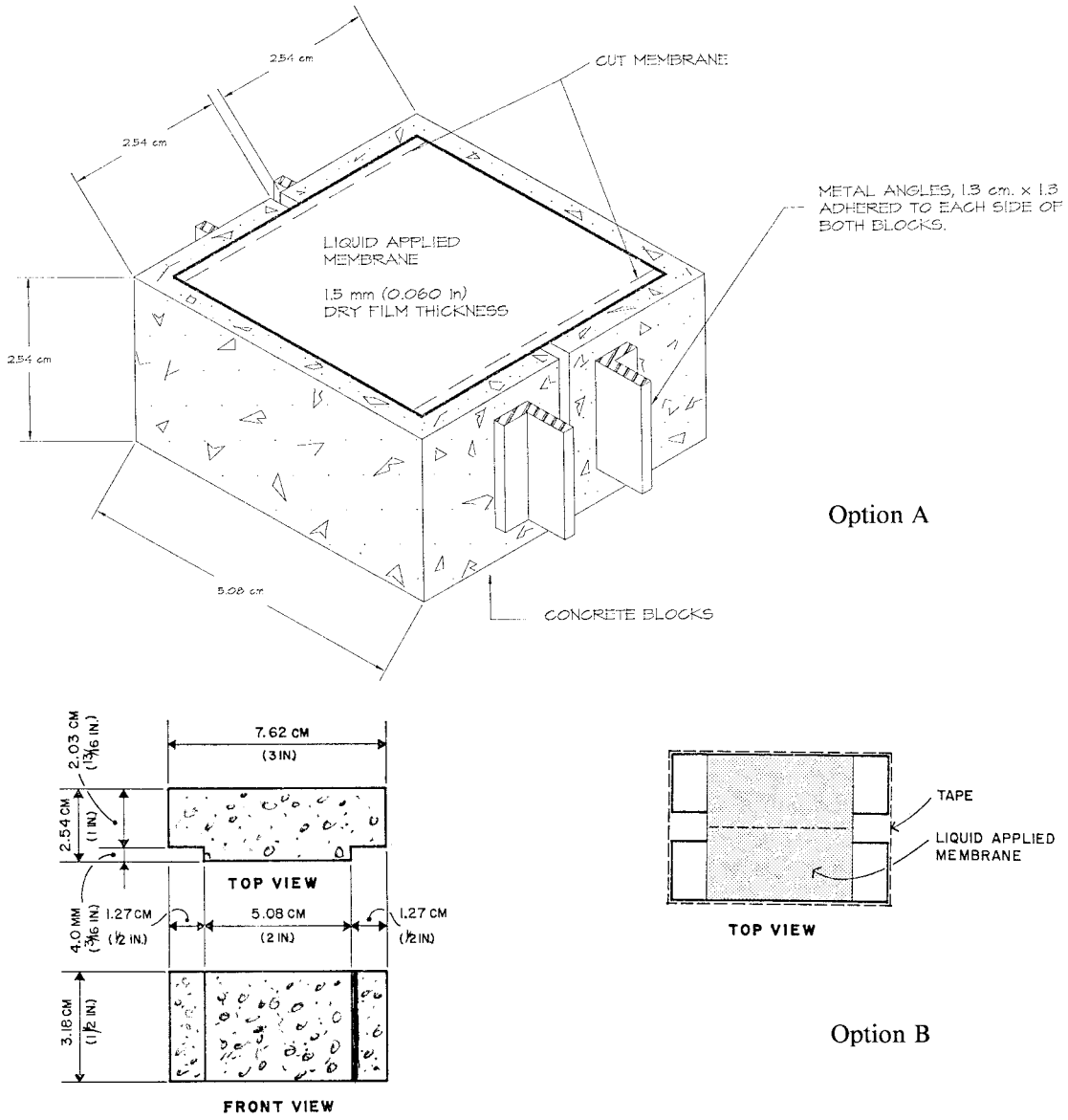

FIG. 1 Test Assembly Options

allow them to dry overnight in an oven at 70°C (158°F) minimum.

8.6 If required to fit the test assembly into the jaws of the testing machine, aluminum angles may be adhered to the sides of the substrates after the membrane has been applied.[6]

8.7 Other substrates may be used, and shall be prepared to provide a clean, level test surface. Other preparation requirements shall be as agreed upon between the supplier and the specifier.

9. Conditioning/Mixing

9.1 Store all materials to be tested at standard conditions of 23 ± 2°C (73.4 ± 3.6°F) and 50 ± 5 % relative humidity for at least 24 h before any test specimens are prepared.

9.2 Follow the manufacturer's instructions for mixing and preparing membrane materials for testing. Thoroughly stir one component samples before using. Mix two component compounds in the ratio, and as recommended by the manufacturer.

10. Procedure

10.1 Five assemblies shall be tested.

10.2 To prepare the test assembly, set two blocks, with 25 by 50 mm (1 by 2 in.) sides touching, in a sand bed. Level the test surface (top) and bind the blocks together using masking tape. Spread the test compound to a uniform thickness of 1.52 ± 0.13 mm (0.060 ± 0.005 in.) over the top 50 by 100 mm (2 by 4 in.) area bisected by the joint between the blocks. The membrane may be applied in multiple coats, if recommended by the manufacturer.

[6] A general purpose, gun-grade construction mastic or a structural epoxy cement such as 3M 2216 B/A has been found suitable for this purpose.

10.3 Cure the test assembly 14 days at room temperature followed by seven days in a circulating hot-air oven at 70 ± 2°C (158 ± 3.6°F). Allow the test specimen to cool to room temperature for at least 1 h. Cut a strip of membrane 6 mm (¼ in.) away from the edge, across the joint on both sides. This will eliminate edge effects (see Fig. 1). If needed, aluminum angles may be adhered to the sides of the assembly after the room temperature curing period (see Fig. 1, Option A).

10.4 Remove the tape from the blocks and place them in the testing machine, preconditioned to −26°C (−15°F) for at least 24 h. Maintaining this temperature, subject the assembly to ten cycles of movement, each cycle consisting of pulling the blocks apart at the rate of 3.2 mm (⅛ in.)/h until the space between them is 3.2 mm and then closing the space at the same rate.

10.5 Upon completion of the ten cycles, extend the membrane to 3.2 mm while still in the machine and examine the membrane for cracking, splitting, pinholes, or any other condition in the area of the joint in the substrates.

11. Report

11.1 Report the following information:

11.1.1 The number of specimens which show no failure, as described in 10.5, in ten cycles, and

11.1.2 All observable physical changes in the membrane.

12. Precision and Bias

12.1 The precision and bias calculations for this test method are based on the results of three laboratories testing three materials.

12.2 Since this is a pass-fail test, the interlaboratory testing was conducted only to ascertain agreement between laboratories. The test results showed 100 % agreement between the three laboratories, indicating that this test method is valid.

13. Keywords

13.1 crack bridging; membrane; waterproofing